

# WHOLESALE SUCCESS


## Agricultural Water & The Rule

**PREPARE YOUR HANDOUTS:**

1. Your Farm Map
2. The PR and Agricultural Water
3. Water Action Plan


1. Map It
2. Potable Use
3. Irrigation
4. Inspect
5. Record

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### Risk Based Management

## MAP IT!



- Fertilizer storage
- Compost production
- Manure storage
- Domestic animals
- High levels of wild animal
- Flooding
- Slopes - runoff to fields
- Cull piles

**INCLUDE NEIGHBOR'S LAND IN WIND AND WATER SHED**

- Fields
  - Tools & Equipment
  - Postharvest Areas
  - Traffic/Movement Flow (to & from fields)
  - Finished Product Storage Area
  - Bathroom Facilities
  - Hand Wash Areas
  - Break Areas
  - Parking & Visitor Access Areas
  - Wildlife habitat
  - Trash & Food Waste/Cull Holding Area
  - Chemical and supply storage
- Minimize Pathogens
- In your growing areas
  - On produce
  - In the packing areas

- ### MAP IT: Water Sources and Distribution Systems on Your Farm.
1. Identify the water sources that are available to your farm: wells, irrigation hydrants, streams, ponds. **(ID CODE FOR RECORDS)**
  2. With arrows show water flow and wind direction.
  3. Identify any potential contamination risks that may exist for these sources.
  4. Describe or diagram how water is used for irrigation on your farm.



**FDA Produce Rule**

**Farmer must:**

- Keep water sources free of debris, trash, domesticated animals.




**FDA POOLING WATER**

**Farmer must:**

- Reduce hazards associated with pooled water which can be a source of contamination.



**Vegetation's Filtering Capacity**




**WILD FARM ALLIANCE**

*UC Davis researchers found grass and wetlands can filter up to 99% of E coli during rain events.*

**Reduce Likelihood of Pathogens Contaminating Crops**

- Intercept waterborne and windborne pathogens before they reach the crop

- Diversion (NRCS 362)
- Grassed Waterway (NRCS 412)
- Sediment Basin (NRCS 350)
- Filter Strips (NRCS 393)
- Windbreaks (NRCS 380)




**Inspect and Record Routinely**

**Contamination can occur at the source**

- biological: livestock or wildlife
- chemical: running into water source

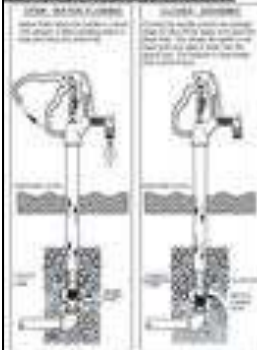

**Within the conveyance and at the point of emission**

- microbes can enter or grow inside irrigation systems
- chemigation improperly cleaned after

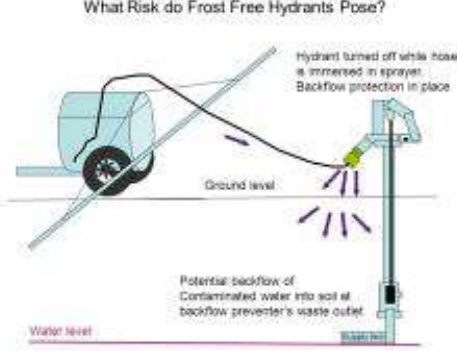


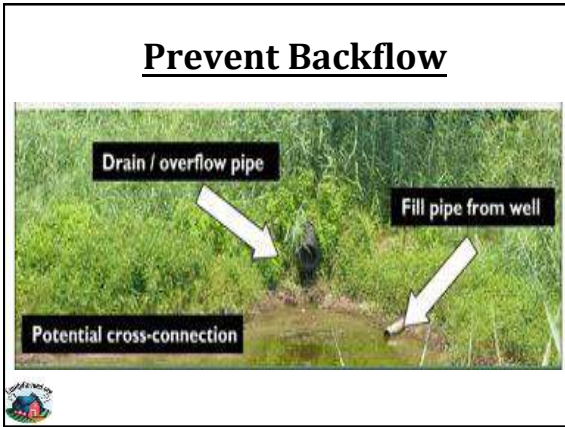
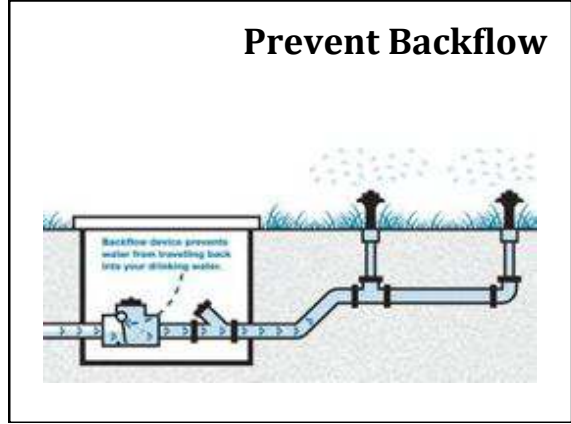
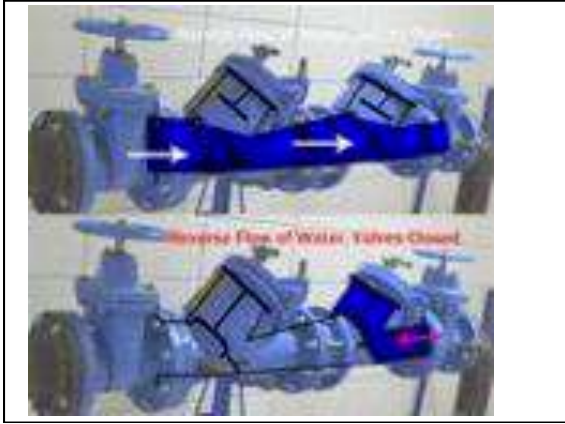
**Prevent Backflow**

**FROST FREE HYDRANT WORKS**

**What Risk do Frost Free Hydrants Pose?**







**Produce Rule Record Keeping**

**Records Must Be Kept Of:**

- Inspection of agricultural water sources and systems, and pooling of water
- Water test results
- Public water (annual) documentation
- Water treatment monitoring
- Microbial die-off or removal rates, and scientific documentation of method

Hand-out

Water

1. Use
2. Testing
3. Quality

**Water used for these activities MUST BE POTABLE**

- washing hands during and after harvest
- on food-contact surfaces and ice for post harvest
- used to directly contact produce during or after harvest
- used for sprout production
- for agricultural tea

FDA: during and after harvest activities

Water for these uses may not be from untreated ground water

**All "Post Harvest Water" Must Be Potable**

**- No detectible E. coli -**

**TEST FOR GENERIC COLIFORMS & E. COLI**

**Produce Rule TEST ONCE A YEAR**

**Ground: 4 times a year base, then once a year**

**Municipal: Request municipal records?**

**Untreated Surface: Do not use for postharvest**

- Test close to end use
- Keep records of results.

Hand-out



**Growing Activities: Directly Applied To Growing Produce**

**TESTING Required:** Water directly contacts the harvestable portion of a crop prior to, during, or after harvest

**TESTING NOT Required:** If irrigation water does not contact the harvest portion of covered produce



- Source?
- Use: What activities will it be used for?
- How often must it be tested?

 A photograph of a well structure with a pump and a large tank, situated in a grassy field.

- Source?
- Use: What activities will it be used for?
- How often must it be tested?

 A photograph of a reservoir with a well structure and a building, situated in a rural landscape.

**Well water pumped into reservoir for irrigation.**



Source?  
Use: What activities can it be used for?  
How often must it be tested?

 A photograph of a field with rows of crops, showing the use of the water storage tank.



**LET'S DISCUSS IT! USES AND CRITERIA**

**The Produce Rule and Agricultural Water**

**WHAT WATER IS REGULATED BY THE PRODUCE RULE?**  
 FDA defines "agricultural water" as "water used" in certain activities (spraying, harvesting, packing, or holding covered produce on a farm or covered produce sale exclusion) where water is intended to or likely to contact covered produce or food contact surfaces, including water used for:

- 1. Harvesting, Packing, and Holding Activities, and Growing Sprouts**
  - Hand washing during harvest/post harvest handling
  - Food-contact surfaces (includes ice)
  - Facilities that directly contact produce during harvest or post-harvest activities
  - For sprout irrigation
  - For agriculture use
- 2. Growing Activities (Other Than Sprouts)**
  - When used in a manner that directly contacts the harvestable portion, prior to harvest. (Water used in irrigation methods that do not directly contact the harvestable portion of covered produce and not regulated) (e.g., drip irrigation on carrots does not directly contact the harvestable portion and is regulated)

In general, "all agricultural water must for each and of adequate sanitary quality for its intended use."

**WHEN DO FARMERS HAVE TO COMPLY WITH TESTING WATER?**

Farm Size	For all water use, except growing sprouts	For Growing Sprouts
Very small farms, > \$250,000	6 years	3 years
Small farms, \$250,000 < \$500,00	5 years	2 years
Large \$500,00 and more	4 years	1 year

**FILL IN YOUR WATER ACTION PLAN**

**Agricultural Water Quality Testing And Use Action Plan**

Lab information (name, address, phone): \_\_\_\_\_

Lab information (name, address, phone): \_\_\_\_\_

Area of Use/Action	Source and ID	How often is this source tested?	Who is responsible?	Where?	Record?	Use?	Check in
Water Quality Testing	Ground, surface, or municipal and identifying number		Who collects the samples, records the results, and oversees corrective actions.	Lab name	What records are kept for this action? Where?	What agricultural activities is this water is used for?	Done Not Done
Water Quality Testing							

**WHOLESALE SUCCESS**

**Biological Soil Amendments of Animal Origin**

**PREPARE YOUR HANDOUTS:**

1. Your Farm Map
2. The Produce Rule and Biological Soil Amen. . .
3. Action Plan and Record

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**PR Encourages Compost Use**

*Does not require a waiting period before harvest*

- If treated BSAs (ie. composted manure) are applied in manner that minimizes the potential for contact with covered produce during or after application, then you do not have to wait any specified number of days between application and harvest.

What does minimize contact mean on your farm?





**FDA FDA Produce Rule**

**Handling, Conveying And Storing A BSA**

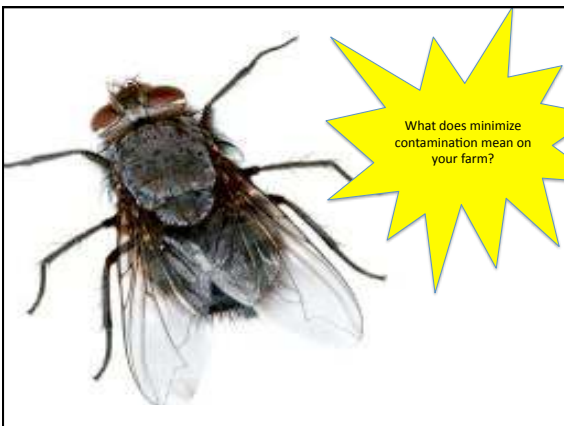
*Must be done in a manner and location such that it does not become a potential source of contamination to:*

- Produce
- Food contact surfaces
- Areas used for a covered activity
- Water sources
- Water distribution systems
- Other soil amendments

What does this mean on your farm?

**FDA FDA Produce Rule**

When using equipment, use it in a way that minimizes the potential for contamination of produce.



**Materials: The Produce Rule and Biological Amendments**

The Produce Rule and Biological Amendments of Federal Register - Action Plan and Record

Biological Soil Amendments (Of Animal Origin: Manure, Compost, Compost Tea, Fish Emulsion, Blood And Bone Meal, And Other)	Supplier's Name	Product & Material Or Component	Quantity (Dry Wt)	Application Rate	Field Application Harvest Date	Application's Name
				- Crop - Compost with crop		

Understanding Manure, Compost And Other BSA Use




**The Produce Rule and Domestic and Wild Animals**

*Farms are not required to exclude animals from outdoor growing areas, destroy habitat, or clear borders around growing or drainage areas. Nothing in the rule should be interpreted as such.*

Predatory animals, such as hawks, or owls, can manage rodents and squirrels and can be good for food safety.

- A crop should not be planted directly under a raptor nest box, or roost.
- Farm activities should not carry -predator feces into produce areas



**The Produce Rule and Domestic and Wild Animals**

**The same standards apply to domestic and wild animals:**  
*“take all measures reasonably necessary to identify and not harvest produce that is likely to be contaminated”*




**You’ve Identified a risk. How will you mitigate it?**

**Domestic Animals**


Should be located

- down hill
- down water
- down wind

from produce and water



what happens up water doesn’t stay up water



Avoiding contact with animals other than working animals, and taking appropriate steps to minimize the likelihood of contamination of produce when in direct contact with working animals



**WHAT IS YOUR POLICY?**




**The Produce Rule and Domestic and Wild Animals**

Although the Produce Rule does not require establishing waiting periods between grazing and harvest, the FDA encourages farmers to voluntarily consider applying such intervals as appropriate for the farm’s commodities and practices.



**Be aware, that most audit programs do require waiting periods or have other standards.**

**Animals Nearby Farm or Uphill**

Animals on hillside above crops may increase risk when rain carries pathogens into crop fields.



**Number of Animals**

High concentrations of wildlife in the growing and harvesting environment increase risk.



At a minimum, all covered farms are required to visually examine the growing area and all covered produce to be harvested, regardless of the harvest method used.

RISK ASSESSMENT - General					
Inspection Date	Location/Field	Area affected	Corrective action or prevention method if necessary	Identified by whom	Date corrective action completed

PR does not require documentation on monitoring. Many 3<sup>rd</sup> party audits do require documentation.




Document  
Make decisions  
Bury, scare, remove  
Inform workers




Also, the PR requires farms to do assessments during the growing season, and if significant evidence of potential contamination by animals is found, to take measures reasonably necessary to assist later during harvest.



**Wildlife Corridors**  
 Allow wildlife to access resources without having to walk across crop fields or leave their preferred habitat







**Crop Placement**  
 Crops should not be planted near, down wind, or down water of manure piles or other sources of contamination.






**Factors in Survival of Human Pathogens**

- **Direct Sunlight:** UV rays and drying can decrease pathogens
- Pathogens persist longer in **cool/moist conditions**
- **Freezing** by itself does not completely kill pathogens (E coli O15 stored at -80° to preserve viability)
- **Rapid freeze-thaw cycles** can cause rapid death of pathogens in soil
- **Desiccation** in dry soils, wind, sun





Source: Wild Farm Alliance  
 A Farmer's Guide to Food Safety and Conservation

**Vegetation's Filtering Capacity**  
 Windbreaks and hedgerows reduce the potential of dust-borne pathogen movement from contaminated areas.

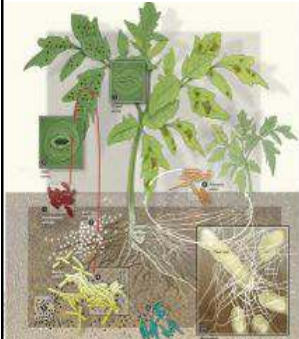
Jacobs Farm  
 S. Earnshaw

### Vegetation's Filtering Capacity

**UC Davis researchers found grass and wetlands can filter up to 99% of E coli during rain events.**

### Non-Pathogenic Beneficial Microbes Generally Prevail if Diverse Populations are Present



- Outcompete the pathogens for food, water, and space
- Kill and consume the pathogens
- Make conditions unfavorable by tying up critical growth nutrients

### Soil Management Affects the Survival of Human Illness Pathogens

**Microbial diversity helps to reduce pathogen survival**

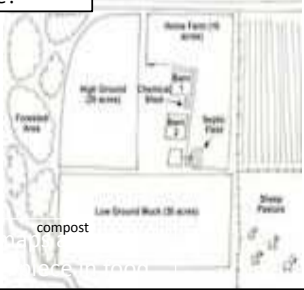
- Cover crops significantly reduced e-coli in a field with raw dairy manure solids
- E-coli declined faster in organic systems than non-organic



A.D. van Diepeningen, O.J.de Vos, and A.H.van Bruggen 2005

### Risk Based Management And Conservation

1. What potential contamination risks do you have?



2. What beneficial conservation practices can you use?

**Land Use Action Plan:** State clearly what you plan to do and create accountability.

Area of food Safety Action	What	How	Who	When	Training	Record	Rank	Check
	How is this done?	Is a practice or SOP written elsewhere?	Who is required to do this?	When is this done?	What training is done, who, and when?	What records are kept? Where kept?	1-5 highest priority	Done Date 1/14/16
<b>B- Barrier -- Assess Risk of Pathogens Entering the Farm</b>								
Ba. Airborne Pathogens								
Bb. Waterborne Pathogens								

**Examples for Land Use Action Plan and Mapping Exercise**

A Land Use Action Plan helps to assess "areas of food safety actions" that should be addressed because of contamination risks, and it describes a set of steps that will reduce these risks. The following examples are divided into four categories that help to minimize pathogens from a) entering the farm, b) contaminating crops, c) spreading from livestock to crops, and d) moving to the wider landscape. The farmer can pick and choose from the examples in these categories, and/or use their own experiences to appropriately fill out their Land Use Action Plan (see three page chart).

A Farm Map can be a valuable visual depiction of pathogen sources, such as animals and manure, and pathogen movement via wind, water, animals and people. The farmer may want to use some of these same examples in these four categories below on their farm's map. Before beginning to add those to the