

NATIONAL YOUNG FARMERS COALITION

Rainwater Catchment and Food Safety:

An Urban Grower's Tipsheet



Goal

THIS TIPSHEET IS MEANT FOR FARMS WHO ARE:

- “Qualified Exempt” from FSMA’s Produce Safety Rule (PSR,) and;
- aren’t trying to pass a GAP audit, but still want to grow safe, healthy food for their community.

For “fully covered” farms under FSMA or farms that are getting a GAP audit, they must have many of these procedures in place.

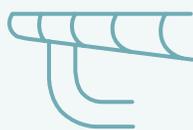
Don’t know if you’re covered or not? Check out the second chapter of our [guidebook](#).

The water section of FSMA’s Produce Safety Rule is currently under review by FDA. You can read more about “agricultural water” in our [guidebook](#) and find some basic guidelines for evaluating your microbial water quality. You can also learn more about the original rules about water [here](#).

We want you to understand the food safety risks around using and storing rainwater and reduce those risks!

Rainwater catchment is often an excellent option for urban growers, especially if the costs of connecting to municipal water are restrictive. Many resources exist for setting up your rain harvesting system. There may even be local resources to get you a barrel at no- or low-cost. However, according to FSMA’s Produce Safety Rule, stored *rainwater is considered surface water*, can really vary in microbial quality, and can be riskier than well water or municipal water.

This is not to say that urban producers should not catch rain, this is meant to explain the risk so you can make the best decisions for your farm and community. Establishing a process for evaluating water quality—from a microbial point of view—is a good way to continue utilizing rainwater safely, and avoid potential food safety risk to your produce, yourself and your customers/community.



RAIN → GUTTER/COLLECTION → RAIN BARREL → HOSE/BACKPACK SPRAYER → CROP

SOME QUESTIONS TO CONSIDER WHEN EVALUATING RISK:

- 1 Is the water coming into contact with the harvestable portion of the crop?
- 2 How are you irrigating? Are you using sprinklers, flooding, hose, drip tape? Are you applying water in other ways (see chart below)?
- 3 How long until the crop is ready to be harvested? The longer the window until harvest, the more likely a portion of the bacteria will die off.
- 4 Is the crop typically eaten raw? Crops eaten raw like lettuce are especially high risk if water is contaminated with pathogens. FDA uses the term “covered produce” and dive into that definition in our guidebook on page 20 and 21.
- 5 Is the water needed to clean, wash, sanitize, consume, or for handwashing? The FSMA Produce Safety Rule prohibits the use of untreated surface water during and after harvest. Use municipal or groundwater for this purpose or consider whether you can market the produce without washing it to further reduce the risk.

Why is stored rainwater considered surface water and why is it risky?

Rain is considered “surface water” when it makes contact with any surface as it’s being collected. Rainwater is often collected from gutters and rooftops and held in cisterns. These surfaces obviously aren’t sanitary and could have pollutants, contamination, or debris that enter the barrel with the rainwater. Also, these holding tanks could be a place where pathogens could thrive.

Agricultural Water is water that comes into “direct contact with the harvestable portion of covered produce or food-contact surfaces (including hands).” If you want to dive into more details of the water section of the Produce Safety Rule, we recommend this resource.



Evaluating risk: should I use rainwater or municipal water?

<p>Low risk activities: OK TO USE CAPTURED RAINWATER.</p>	<p>High risk activities: DO NOT USE CAPTURED RAINWATER. USE MUNICIPAL WATER .</p>
<ul style="list-style-type: none"> • plant starts/seeding • starting a compost pile* • urban livestock • cover crop irrigation • fruit trees (or other crops where the water does not contact the harvestable portion of the crop) 	<ul style="list-style-type: none"> • post harvest handling (washing produce, spraying to remove field heat) • cleaning and sanitizing food contact surfaces • handwashing and drinking • irrigating close to harvest date • compost teas** • backpack spraying/foliar feeding

* Using contaminated surface water on a compost pile could contaminate the pile and require growers to restart the composting process.

**Wondering what’s up with compost tea? Check out page 69 of our guidebook.

Other Considerations

TESTING RAINWATER

Since your stored rainwater is considered “surface water,” it’s likely to fluctuate in quality. The only way to know details about the microbial quality of your water is by testing it.*

- A **generic E. coli test** is the most important test that should be conducted, but you can also test for other contaminants that may be in the water. The water testing laboratory will provide testing options. Check with your local county health department for water testing laboratories near you or see this [map](#).
- **Follow the instructions** from the laboratory; most will provide sampling bottles that you pickup.
- The water sample should be taken from the rain barrel’s faucet or hose and not dipped into the top of the barrel. Here’s a basic [video](#) about taking a water test, but refer to your lab for the **best practices** for your specific test.
- **Compare your results** with the federal and state standards for generic E. coli and other contaminants (see our guidebook for some helpful ranges of numbers). (Source: <https://njaes.rutgers.edu/fs1218/>)



CONSTRUCTING YOUR WATER CATCHMENT VESSEL!

There are some great resources on building rainwater catchment systems, including [this one](#).

What kind of materials are your rainwater catchment vessels made out of? Are they food-grade materials that are easy to clean?

- If you aren’t testing your rainwater, **it’s safest to operate with the mentality that it likely contains E. coli** + other contaminants from run off, animal exposure, etc., and you should take necessary precautions to mitigate risk:

- Refer to risk assessment chart above.
- Stretch the time between applying water to the crop and harvest as long as is reasonable. Cool tool to calculate E. coli die-off based on test results: <https://ucfoodsafety.ucdavis.edu/sites/g/files/dgvnsk7366/files/inline-files/268306.xlsx>
- Use treated water sources (municipal water) for higher risk activities.

TREATING CAPTURED RAINWATER!

There are a number of options for treating captured rainwater for plant pathogens. However, while there are many chemicals labeled for controlling plant pathogens in irrigation water or for use in postharvest water, as of the date of publication, we didn’t know of any technically labeled to control human pathogens in irrigation water. We expect that the industry will catch up with the needs of growers quickly!

- **Types of treatments:**

- Antimicrobial pesticide products*: This is a funny name for water treatment options, but is a substance or mixture intended to reduce the impact of pests or plant pathogens.

→ Chlorine

*FDA wants you to remember that the agricultural water requirements are not currently in effect. While you may continue testing your water used for agricultural purposes, FDA does not recommend beginning a new water testing regiment based on the agricultural water requirements outlined in the 2015 Produce Safety Rule.

- Peroxyacetic acid
- Chlorine dioxide
- Antimicrobial devices: work by electricity, light, or physical mechanism.
 - Ultraviolet light
 - Ozone
 - Filtration

- Water treatment requirements are regulated by state so you will have to **make sure you are in compliance with your state laws** if treating your water.

CLEANING AND SANITIZING WATER CATCHMENT VESSELS!

How often do you clean and sanitize your rain barrel?

- It's recommended that you **clean your barrels or vessels before you begin collecting water** and periodically through a cleaning schedule. This schedule will be different for every farm and dependent on the amount of rain, climate, and structure of the barrel.
- Remember cleaning and sanitizing requires the use of a cleaning detergent and a sanitizer. One does not substitute for another!

How often do you inspect your rain barrel?

- It's important to **establish an inspection schedule** (could go hand in hand with your cleaning schedule!) to ensure that the vessel is in good shape: no unwanted leaks or unknown sources of contamination, the spout is clean and functioning, etc. **The Produce Safety Rule requires that farms that are fully covered by the Rule inspect their water system at least once a year.**

DO YOU FILL YOUR RAIN BARREL WITH OTHER WATER BESIDES RAIN WATER (LIKE CITY WATER FROM A HYDRANT, OR GROUND WATER FROM A WELL)?

How would you classify it and consider risk?

- Classified as city or ground water
 - Is the barrel filled with city or ground water only? Has the barrel been retired from roof capture and cleaned and sanitized thoroughly? Is the barrel closed to outside contaminants? Is there a backflow-avoiding mechanism installed in the plumbing?
- Classified as surface water
 - Is it filled with city or ground water mixed with surface water? Is the barrel open (outside contaminants can easily enter)? Is the barrel still used for a combination of city water and rainwater capture (not cleaned between changing use/water type)?

Flooding

As per the FDA, any produce touched by flood water cannot enter the food supply. In an urban farming context, flooding would be when water from a heavy downpour enters the growing area from the street, a body of water, or adjacent land and could bring debris, pathogens, or dangerous chemicals with it.

This resource is supported by the Food and Drug Administration (FDA) of the U.S. Department of Health and Human Services (HHS) as part of an award totaling \$60,000 received from National Farmers Union with 100 percent funded by FDA/HHS. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by FDA, HHS, or the U.S. Government. For more information, please visit FDA.gov.