The Food Safety Modernization Act Produce Safety rule requires all agricultural water to be safe and sanitary for its intended use. Water used for pre-harvest practices and that will be in direct contact with the edible portion of the raw agricultural commodity (RAC) should meet the generic *E. coli* requirements as proposed in the U.S. Environmental Protection Agency (EPA) 2012 Recreational Water Quality Criteria standard. The frequency and number of samples varies depending on the source of water with a higher number of samples required for surface water sources such as ponds, canals and rivers and fewer samples from well water.

Proper sampling and handling techniques and transportation are required to accurately determine the water quality. Contact your laboratory several days prior to sampling. The laboratory you are sending samples to for testing usually provides pre-sterilized containers and other sampling supplies, instructions and record-keeping forms. Proper collection and reliable record keeping are essential. Tracking and properly identifying sampling locations are as important as water collection. Make sure to label the sample containers. Labeling should include: (1) the location of the sampling site, date and time of sampling; (2) sample code or sample number; (3) initials or name of the person who took the sample; (4) type of analysis; and (5) any other information requested by the laboratory.

This information should be written on a waterproof label, which should be securely affixed on the sample container. The same information must also be recorded on the water sample-recording sheet. Keep records of all collected samples and a key for sample identification. Complete a chain-of-custody record form, which will help to keep track of the sample and any mishandling of the sample.

**How to prepare to collect a water sample:**

1. Contact the lab performing the analysis to determine if a special specimen cup or bottle provided by the lab is required. Make sure both parties understand and know what type of microbial testing is needed and the general requirements for collecting a water sample.
2. Use only sterile sampling containers. Most labs provide a 100 milliliter container with a snap-lid or screw-capped lid.
3. Mark the vessel with the following information: date, time, location, name of the person collecting the sample, storage conditions of the sample, test method and sample code (corresponding to a specific location from where you collected the sample).
4. Use sterile single-use gloves to collect the sample.
5. Make sure your hands are never immersed in the water, touching the rim of the lid or container, and avoid placing the lid face down and in contact with dirty surfaces.
6. Make sure you have prepared a clean insulated cooler that will keep the sample below 10° C (50° F) during storage and transport.

**General considerations when collecting a water sample:**

1. Prevent any debris from entering the sample and container during sample collection and shipment.
2. Open the sample container only when you are ready to collect the sample. (Use sterile gloves at all times.)
3. Avoid touching the underside of container lid and inside the container rim.
4. The container should be inclined in a 45-degree angle to collect the sample with the label facing you.
5. Fill the container slowly to minimize any splashing, and avoid filling the container above the marked fill line.
6. Recap the container and with clean and sterile gloves, and sanitize the surface of the container using single use chlorine or alcohol wipes. Avoid sanitizer infiltration into the vessel.
7. The EPA specifies a six-hour delivery time from sample collecting to the lab and a maximum of 24 hours between sample collection and start of analysis.
8. Current industry practices allow up to 24 hours between sample collection and arrival to the lab.
9. When possible, collect samples in the morning when it's cool and there is less potential variation in the microbial population of ground and surface waters.
Tap and Well-Water Sampling (City Water)

- Open the tap to the flow commonly used during operations. The spigot or service connection should be selected based on frequency of use and if this water will be in direct contact with raw agricultural commodities (RACs) and food contact surfaces.
- Let the water run for at least three minutes.
- Follow the same general considerations for collecting a water sample.
- Using sterile gloves, open the clean and sanitized collection vessel and collect at least (> 1.5 liters). Use a wide-mouth container to avoid contamination issues.
- Fill the specimen cup or sterile container provided by the lab up to the fill line.
- Close the specimen cup and place it inside a clean compartment in a refrigerator or inside a cooler with ice that ensures the sample is kept below 10° C (50° F) during storage and later during transport.

Surface Water Sampling

- Avoid collecting sediments from the shoreline.
- Minimum distance from shore is 0.5 meter (Best Practice).
- If possible, collect the sample at the location and depth of the water intake to the irrigation distribution or booster pump; sample size (> 1.5 liters) (Best Practice).
- Follow the same general considerations for collecting a water sample.
- For best description of the microbial populations in this water, collect the sample when it is raining or shortly after rain has stopped.
- Normally, after collecting these samples, the containers are wet. Bring the containers to a dry, clean table, and sanitize the container using a single-use chlorine or alcohol wipe.
- Once the container is sanitized, pour the necessary volume into the labeled container for lab submission and keep the sample below 10° C (50° F) during storage and later during transport inside a clean cooler.

When sampling surface water from canals, it is in the grower’s interest to run water through the field canal and sump accumulation reservoir for at least 5 minutes (if last irrigation was within 48 hours) or 15 minutes (if last irrigation more than 48 hours earlier), especially if daily air temperatures exceed 25° C (77° F).

Sprinkler Head, Emitter Drip-Line Manifold or Drip-Tape Water Sampling

- Avoid contaminating the container with soil.
- Run any of the listed systems for at least three minutes before collecting the sample.
- Follow the same general considerations for collecting a water sample.
- Using a sterile container collect the sample (> 1.5 liters) avoiding any contact with clothing, gloves or field debris.
- Cap the container as soon as you have finished collecting the sample.
- Normally, after collecting these samples, the containers are wet. Bring the containers to a dry, clean table, and sanitize the container using a single-use chlorine or alcohol wipe.
- Once the container is sanitized, pour the necessary volume into the labeled container for lab submission and keep the sample below 10° C (50° F) during storage and later during transport inside a clean cooler.

References

The produce safety project: http://www.pewtrusts.org/en/archived-projects/produce-safety-project


FSMA, Produce Safety Regulation: http://www.fda.gov/Food/GuidanceRegulation/FSMA/ucm334114.htm

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