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# How to Take Water Samples for Irrigation, Frost Protection & Chemical Applications

Water, especially surface water, can be a source of contamination for produce through the introduction of bacteria, viruses, or parasites. For this reason, it is important to assess the quality of any water being used on your crops for irrigation, frost protection, or the application of chemicals. Different water sources and application methods however, require different testing protocols.

In addition to being efficient in terms of water distribution, drip irrigation systems provide the greatest protection from microbial contamination for a number of reasons. 1) Except for root crops, the water does not come in direct contact with the harvestable portion of the plant; 2) the water must go through a filter which can filter out larger contaminants; and 3) drip systems must be flushed and regularly maintained, thus reducing the chance of contaminants lingering in the system.

The risks of microbial contamination from overhead systems is greater because the water (and any contaminants it may contain) comes in direct contact with the edible part of the crop. Overhead systems do not necessarily have filters, and it is easier for contaminants to accumulate in the distribution system (bacteria can grow if they are in water sitting in warm pipes in the sun, and dirt and small animals can get into the system when not in use).

## General Guidelines for Collecting Water Samples

- When possible, take samples in the morning when it is cool. Because pathogen levels can change throughout the day, try to always take your sample around the same time of day.
- Wash your hands before collecting samples, and be careful not to touch sample container lid, rim or lip as this could contaminate your sample.
- Do not open container until immediately before taking sample.
- Sample containers may have powder in them. Ignore this, it is needed for the test.
- When taking a sample from a valve or outlet: Clean the inside of the valve with one side of an alcohol wipe, and the outside with the other side of the wipe (Wipes can be purchased at drug store- make sure it contains only isopropyl alcohol and water). Run water for 3 minutes to purge the line before collecting your sample
- Aim to have your sample in the lab within 24 hours of taking the sample. If taking sample in the evening and you need to keep it overnight, keep it in your refrigerator. If you are delivering the sample in person, you can keep it in a cooler.
- If delivering to lab yourself, aim to have the sample there in the morning and not at the end of the day. If samples arrive too late in the day, they may be invalidated. Try to avoid having samples arrive on Fridays.
- If you are sampling surface water from a pump outlet or valve, and the sample comes back with levels over 235 MPN or CFU's per 100 ml, when you re-take the sample, also collect a sample from the body of water to see if there is any contamination in the distribution system.
- Keep a record of sampling date, time, and location as well as noting any special conditions (presence of wildlife in surface water, etc...)

## If Water is Coming from Well

Take sample directly after the pump and filter, rather than the end of the line. Taking the sample closest to the filter source reduces chances of picking up contamination that could have accumulated in the pipeline or drip lines over the winter. Take the sample after cleaning and changing the water filter. **DO NOT** take sample after fertigation or from a freshly drilled well. After these situations, allow water to flow and replenish the well's storage capacity with new water.

## Note for Overhead Irrigation Systems: Using Surface Water Source:

If you are using a pond, river or stream as the source for overhead irrigation, the sample can be taken from the pump valve or discharge vent, or directly from the water source (see below). If you want to check if the contamination is coming from your distribution system (especially at the beginning of the season in case animals or debris may have accumulated in pipes over the winter), you can compare samples from the surface water and a sprinkler head. To collect sample from sprinkler head, clean out a bucket with soap and water, sanitize it with a bleach solution and then let it dry thoroughly. You can then collect water from the sprinkler head into the bucket and pour it into the water sample container from the lab. Run system for 15 minutes before taking sample.

## Samples from Ponds, Rivers or Streams:

- When setting up the irrigation system, float the pump suction 18 to 24 inches below the surface of the water. This zone that is typically clear of both bottom dwelling plants and surface algae. Do not allow suction to pull from bottom of source as this will be too close to sediment and decaying matter that could hold bacteria and other contaminants.
- Where applicable, maintain inlet and outlet controls of the source water so they are kept clear of debris and are free to flow. When a strong storm comes and purges the water source, contaminants or particulates should freely flow out of the pool.
- Discourage wildlife as much as possible. Geese can dramatically change water samples if nesting or feeding regularly around irrigation ponds. Manage fields near water sources to control for soil erosion and point run-off from entering the water source.
- Take the sample as close to the water intake point for the irrigation system as possible, but in a location free from vegetation and algae. If necessary, clear away any pollen on surface of water before immersing bottle.
- Avoid wading into the water as stirring up sediment will negatively affect your sample results. Take the sample a couple feet from the edge of shore. You can attach the sample bottle to a pole to do this.



Photo Credit: Dr. Betsy Bihn, Cornell University

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