Enhancing The Safety of Locally Grown Produce

Water Use

Water is an essential part of life and an essential part of any farm. It is necessary for growing produce and often for cleaning produce before it is sold. Water may also be used to protect crops from frost or to apply fertilizers or pesticides. Ensuring that you have clean water on the farm for these uses is an important part of minimizing contamination by disease-causing microorganisms called pathogens. Water can carry pathogens such as *Giardia*, *Cryptosporidium*, Norovirus, *Salmonella*, and *E. coli* O157:H7.

*I*rrigation water

Irrigation water usually comes from either wells or surface water sources such as ponds or streams. Municipal water is sometimes used, but this is often an expensive option. Although municipal water will minimize contamination risk, it is usually not feasible to use for irrigation. Potable well water (water safe for drinking) is also a good choice. Surface water can be used with certain precautions.

Well water – Wells can be either drilled or bored. Bored wells are usually shallow from 20 to 50 feet deep and have a larger diameter wellhead of two to three feet. They are sometimes cased with concrete and have concrete caps. Because these wells are shallow, if not properly constructed and maintained, they can have a higher potential for contamination than a drilled well. Older bored wells are vulnerable to surface water that can carry pathogens moving down the outside of the well casing or through gaps in the concrete casing created by roots from shrubs or trees.

Drilled wells are usually deeper and, depending on the geology of the area, penetrate into hard rock. Because these wells are deeper, they are usually less vulnerable to contamination; however, any well that is poorly constructed and maintained can provide a conduit for pathogens into the water supply.

The wellhead location is also important for minimizing risk.

◈ Do not locate wellheads in areas that receive runoff from roads, heavy animal agriculture areas, manure storage areas, or composting areas.

◈ Do not locate wellheads within 150 feet of waste lagoons, septic tanks or drainfields.

Surface water – Ponds and streams can be used for irrigation, but be very aware of what is upstream from where water is drawn. Upstream areas that are heavily grazed or have animal access to the stream pose a higher risk of contamination.

◈ Exclude animals including waterfowl and pets from ponds used for irrigation water.

◈ Avoid using surface water after heavy rainfall until the sediments have settled, and the water is clear again. Research has shown pathogens are higher in stormwater and in sediments.

◈ Use drip irrigation where practical. In general, drip is preferred to overhead irrigation because the water is less likely to coat edible portions of the crop. This is particularly true when using surface water sources.

◈ Consider irrigating early in the day, if overhead irrigation must be used, so sunlight and drying can reduce the level of pathogens.

◈ Avoid overhead irrigation of produce within two weeks of harvest. This can reduce risk but is not an absolute guarantee of safety.

◈ Be aware that standing water in a field can be a source for pathogens, so take care to minimize its contact with the surface of produce.
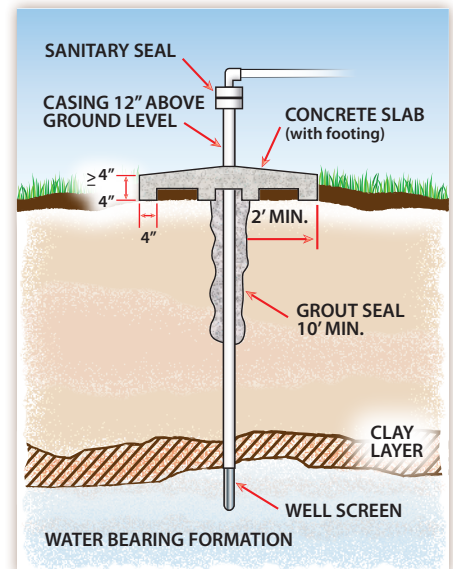
▲ Diagram showing proper drilled well construction. Notice the concrete slab around the wellhead that prevents surface water from moving down the outside of the well casing. This type of slab is critical for both drilled and bored wells to prevent contamination.

▲ This well has a concrete pad to help minimize the risk of contamination.

Courtesy of Jay Payne, Cedar Grove Farm

Water testing

▶ **The most important thing that can be done to ensure the safety of irrigation water is testing for fecal coliform bacteria. Extension agents can provide containers and teach you how to take a clean sample.**

Currently, there is not one single nationwide standard for irrigation water. Good examples of standards are those established by the California produce industry. According to their standards, overhead irrigation water must have a 5-sample mean *E. coli* density lower than 126 CFU/100 ml, and no sample can exceed 235 CFU/100 ml. For drip irrigation, water must have a 5-sample mean *E. coli* density lower than 126 CFU/100 ml, and no sample can exceed 576 CFU/100 ml. Avoid using irrigation water with these higher levels of fecal coliforms on produce that is consumed without cooking like lettuce or strawberries.

◈ Test well water at least once a year.

◈ Test surface water more often, at least quarterly.

◈ Keep the records of the water tests to document that you have managed your farm water as safely as possible.

▲ Surface water ponds can be used for irrigation with precautions.

Check with your local Extension office for information on agencies that test water in your state.

If well water test results indicate high fecal coliform levels, inspect the well for cracks or other damage that could allow in surface water. Once construction or maintenance problems are resolved, the well can be cleaned using shock chlorination. County Extension agents can provide information on the proper steps for this.

If surface water tests are high for fecal coliforms, evaluate potential upstream sources of contamination. Using a filter or a small settling basin can sometimes help reduce coliforms.

Produce rinsing

▶ **Many crops need an initial rinsing before they are taken to market. Greens, root crops, and some fruits are often rinsed to remove dirt. Water used for rinsing produce must be safe for drinking.**

◈ Use drinking water from your well or a municipal source for produce rinsing.

◈ Never use water from streams, ponds, lakes or other surface water sources to rinse produce.

◈ Test well water used for produce rinsing for fecal coliforms at least once a year and keep the records.

For more information on water standards, see:

Suslow, Trevor V. Standards for Irrigation and Foliar Contact Water. Produce Safety Project Issue Brief. PEW Charitable Trusts.

www.producesafetyproject.org

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