



NEW ENGLAND EXTENSION FOOD SAFETY CONSORTIUM

GOOD AGRICULTURAL PRACTICES

On-Farm Water Resources
Irrigation & Drinkable (Potable) Water

New England GAP Guidelines Addressed Here:

Water Sources for Irrigation and Drinkable (Potable) Water

- Wells are protected from outside contamination.
- Drinkable water supply and/or wells are tested at least once a year.
- Are records of all water tests on file.

On your farm, you may use water for irrigation, applying pesticides and fertilizers, cooling and/or frost control. In packing operations, water is used to cool and wash produce, to clean and sanitize your plant, and to wash your hands. If the water you use is contaminated with pathogens (microbes that can make you sick), you run the risk of contaminating the food you grow and sell.

Water can be the source of a variety of pathogens including *E. coli O157:H7*, *Salmonella spp.*, *Shigella spp.*, *Cryptosporidium parvum*, *Giardia lamblia*, *Cyclospora cayetanensis*, and the Norwalk and *hepatitis A* viruses. Contaminated water used for irrigation and washing produce has been linked to outbreaks of *Salmonella*, *Giardia* and *Cyclospora*.

Municipal or public water systems are the best source of water for any on-farm use and present the lowest risk of contamination. Public water supplies are monitored and treated for contaminants. Private wells that are tested annually and found to be safe are also unlikely to contaminate produce. Ground water is less likely to have microbial contaminants than surface water. Surface water (ponds and streams) is most likely to be affected by watershed activities and season and, therefore, present the greatest risk of contamination from harmful pathogens.

What can you do?

- **Recognize the risks associated with your water source.**

The risk for contamination of your produce with water depends on a number of variables including:

- what you are growing (cantaloupe or lettuce may be more risky because they are grown close to the ground and may be difficult to clean)
- whether your crops are grown near the ground or on trees
- your source of irrigation water

- the condition of your water supply system--well or public

Take a look at the source of your water; consider possible sources of contamination, including animal pastures, manure storage facilities, feed lots, faulty septic systems and high concentrations of wildlife. Was your land always used for agriculture? What potential sources of contamination are in the watershed area--sewage treatment plants, chemical plants, livestock operations?

- **Rate Your Risk**

Take a minute to complete the "[Water Sources Questionnaire](#)" to help you think about the safety of your water supply.

- **Test your water**

Water testing can be useful tool, providing you with information about the quality and safety of your water supply. Contact your local or state health department for the names of laboratories licensed to test water.

Standard/conventional water tests will tell you if your water supply contains “fecal coliforms” or “generic” E.coli. The presence of these organisms shows that your well is contaminated with bacteria, but does not tell you about the presence of pathogens (bacteria, viruses or parasites that can make you sick) like E. coli O157:H7. If you are concerned about possible contamination by specific bacteria or other pathogens, you should request that your water sample be tested for these.

If you use municipal water--

- request records regarding their testing programs for your files, annually.

If you use well water--

- it is recommended that you test the well water 1-2 times per year.
- to process your produce, you will need to test well water at least once per year to comply with processing regulations.

Note: Changes in your water quality, such as cloudiness after a storm may indicate that surface water is contaminating your well. Check your well construction and pump. Divert any surface water that pools away from the well head. Test the water again soon after a storm. (See [Indiana Farmstead Assessment](#))

If using surface water for irrigation--

- testing can be useful tool in determining your risk for contamination. Test surface water three times per year--at planting, at peak use and at or near harvest. A single test may not indicate the potential for water to be contaminated. If pathogens are

present in low numbers, they may not show up in your test.

If tests are positive for fecal coliforms--

- this may indicate the water may have been contaminated with manure or harmful pathogens.
- you might want to consider testing for pathogens as well.
- wells can be treated with chemicals to reduce fecal coliforms.
- filter water or use settling ponds to reduce fecal coliform counts.

Keep records for all water tests

Record test results, review them regularly and note changes in water quality over time. In addition to water analysis test results, you should keep records of well construction details and dates, and maintenance records for the well and pump.

Water Source Questionnaire

Answer all of the questions that apply to your operation. For questions with a "yes" answer, pat yourself on the back for doing a good job. If you answered "no" to any of the questions, you should develop an action plan to reduce your risk. Use the information in this GAP education series and any of the resources listed below to help you develop your action plan.

<i>Yes</i>	<i>No</i>	<i>Questions</i>
		Do you have a maintenance schedule for your wells?
<i>If you use well water for spray irrigation, mixing pesticides, cooling fruit, or washing vegetables, is your well at least 100 feet from a:</i>		
		Manure storage facility?
		Livestock area?
		Septic system drainage field?
		Discharge area for milk house wastewater?
		Is the drinkable water/well water sources tested at least once per year?
		Are records of all water tests on file?
		Have you installed a backflow prevention device or other system to prevent contamination of clean water supplies by potentially contaminated water?
<i>If you use surface water for irrigation and pesticide application:</i>		
		Do you used drip, under-tree or low volume spray irrigation to reduce water contact with fruit?
		If you use overhead irrigation or evaporative cooling, do you test your irrigation water for fecal coliform concentrations during the growing season?
		If livestock operations are located nearby the irrigation source, are animals excluded?
		Are good management practices in place to protect the quality of irrigation water?
		Do you use only potable water to apply foliar applications including pesticides, nutrients, and growth regulators?
<i>In the barn or packing house:</i>		
		Does water used to cool, clean and sanitize produce meet the EPA Drinking Water Standard?

Adapted from: G. Baird Wireman, D. Granatstein, E. Kirby, E. Adams, Washington State University Cooperative Extension and S. Ingham, University of Wisconsin-Madison, ***Reducing Food Safety Risks in Apples: A Self Assessment Workbook for Producers of Apples, Juice, and Cider.*** May 2001

Additional References and Resources:

Guide to Minimize Food Safety Hazards for Fresh Fruits and Vegetables

<http://www.cfsan.fda.gov/~dms/prodguid.html>

US Department of Health and Human Services, Food and Drug Administration

Center for Food Safety and Applied Nutrition (CFSAN), October, 1998

Food Safety Initiative Staff, HFS-32

U.S. Food and Drug Administration, Center for Food Safety and Applied Nutrition

200 C Street S.W. Washington, D. C. 20204

Food Safety Begins on the Farm: A Grower's Guide Good Agricultural Practices for Fresh Fruits and Vegetables

Anusuya Rangarajan, Elizabeth A. Bihn, Robert B. Gravani, Donna L. Scott, and Marvin P. Pritts.

Cornell University Good Agricultural Practices Program

(607) 254-5383, eab38@cornell.edu

Indiana Farmstead Assessment: Drinking Water Well

Purdue University

<http://www.ecn.purdue.edu/SafeWater/farmasyst/surveys/factsheets/farmassess1.htm>

Reducing Food Safety Risks in Apples: A Self Assessment Workbook for Producers of Apples, Juice, and Cider.

May 2001

G. Baird Wireman, D. Granatstein, E. Kirby, E. Adams, Washington State University Cooperative Extension and S. Ingham, University of Wisconsin-Madison

<http://organic.tfrec.wsu.edu/FoodSafetyWeb/Home.htm>

Waterborne Pathogens in Agricultural Watersheds

Barry Rosen, University of Vermont

NRAES-147; Natural Resource, Agriculture, and Engineering Service (NRAES) Cooperative Extension in cooperation with USDA Natural Resources Conservation Service and the Watershed Science Institute

NRAES, Cooperative Extension

152 Riley-Robb Hall

Ithaca, NY 14853-5701

United States Environmental Protection Agency (EPA) Office of Water

Home page: <http://www.epa.gov/safewater/standards.html>

Current Drinking Water Standards: <http://www.epa.gov/safewater/mcl.html>

State Approved Laboratories

Contact your state health department for laboratories licensed to test water.

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Contact Information

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