

Dear Rochelle

by Rochelle Eisen

Dear Rochelle,

I run an organic veggie farm and I am completely lost on what type of water testing I have to do so I can apply for organic certification. Can you help me?

Wet in Rutland

Dear Wet,

I hope I can help you, as this is actually a complicated topic. It is true that many certification bodies ask for evidence of appropriate water testing but I am actually confused by that request! Let me explain...

You, as a producer, are responsible for the quality of water used to grow, wash, process food. There are various government regulations and health authorities that might be interested in your water quality. The concern is that your vegetables or fruit should not make the consumer sick and that water you use for any function on farm should not contaminate your land. But is it the re-

sponsibility of the certifier to make sure you are following these rules by asking you for water tests? And if they ask you for tests what should the tests cover?



Let's start with the Canadian Organic Standards and what they say about water quality. There are a few direct references to water that I will mention, but first let me point out some indirect references. Firstly, the producer is required to take measures to minimize the contamination of land and crops with substances that are prohibited by the standards (paragraph 5.2.1). On the other hand the Introduction, part III, states "*Organic practices in this standard cannot assure that organic products are entirely free of contaminants since exposures of such compounds from ... ground water and*

other sources may be beyond the control of the operator... The practices permitted by this standard are designed to assure the least possible residues at the lowest possible levels.” In addition, don't overlook Part I in the Introduction that says that organic food should comply with all applicable regulatory requirements. This section serves as a reminder that organic products are not exempt from the laws of the land.

Specific references in the standards to water quality are: 1) livestock must be provided with clean water (para 6.4.5), and 2) reclaimed [such as gray water] water cannot be used on edible plant parts and root crops (PSL Sec 4.3 Crop Production Aids and Materials). And that is it. There is *no specific requirement* in the Standards for water tests.

So why do some certifiers ask for water tests, and others do not? And what sorts of tests are requested?

Mainly there are two types of contaminants for concern: biological (pathogens such as e-coli), and chemical (such as pesticides, chemical fertilizer, or industrial waste). The producer must take measures to minimize contamination and the certifier may want to assess the risk of contamination by reviewing test results. This process would bring this issue to the producer's attention so that they do something about it. We have seen cases where wells have been contaminated by leaking septic fields without the producer noticing the problem. Farmers should not be waiting for their certifier to practice due diligence.

Microbiological contamination of water used for irrigation or, particularly, used for washing, rinsing or cooling vegetables can make people sick. This is not good for the person, producer, certifier, or the organic movement. Some crops are particularly vulnerable, such as “ready to eat” vegetables and leafy greens. The Canadian Food Inspection Agency guidelines about rinsing or washing minimally processed, ready to eat vegetables require using water that meets drinking water guidelines (potable). Some certifiers may ask for tests to assess the risk of water contamination.

Water taken from an open source such as irrigation ditches, ponds, rivers, lakes, or



Cold Water Washing

Studies have shown that immersing fruit and vegetables in water that is colder than the fruit and vegetable can cause water to be drawn inside the produce due to the temperature gradient. If this water contains pathogenic microorganisms, these may infiltrate the fruit and vegetables, thereby escaping subsequent cleaning procedures. This route of entry by pathogens has been demonstrated in apples with *Escherichia coli 0157:h7* (Burnett et al., 2000, Buchanan et al., 1999) and tomatoes with *Salmonella* (Zhuang, 1995). Page 28 of the On-Farm Food Safety Guidelines for Fresh Fruit and Vegetables in Canada Canadian Horticultural Council, Third Edition, January 31, 2004.

shallow wells is most likely to have microbiological contamination. The problem with testing is that open water sources are particularly vulnerable to change during the year. When the water is at its lowest is usually when there is the highest risk, but there is also a higher risk during surface runoff occurs if there is any chance of surface runoff contamination. Many tests might be needed to assess risk each year. The BC Ministry of Agriculture and Lands (BCMAL) suggests tests for e-coli & fecal coliforms be done at least twice a year (high and low water) as screens for micro-biological contamination, but there is still no guarantee that this will cover all possible microbiological risks. Any time there is a change in the irrigation source, water levels, or upstream activity there is increased risk.

You also have to consider how close your last irrigation is to your harvest window, as that alone increases risk of pathogens being present. BCMAL suggests that to reduce the risk you stop irrigation 2 weeks

before harvest if your water has biological contamination. It also makes sense to use types of irrigation (eg drip) where water will not touch the edible portion of the crop. Don't count on using water from open sources for washing or rinsing crop – this is a higher risk and you may need to figure out an allowable water treatment to clean the water, or find a potable source for this activity. Be sure to inform your clientele that vegetables require a good wash prior to eating.

Chemical and heavy metal contamination: Contamination of crops or land with pesticides, chemical fertilizers, or industrial waste is prohibited under paragraph 1.4 of the standards. This could occur either in irrigation or wash water.

If you farm in an agricultural area, it is possible there may be some chemical contamination in your water. However, you need to watch out for higher risk contaminants such as industrial wastes being flushed into the water, substances being applied directly into the water, or larger concentrations of fertilizers or chemicals from bad farming practices upstream from you. You are required to report possible contamination to your certifier.

It is unusual for a certifier to ask for a general chemical screen on water – this is because there are so many chemicals including minerals in water that it is difficult to decide which ones should be tested, unless there is a specific concern. Furthermore, concerns around surface water differ from groundwater sources. This is why many Organic Farm Plans ask you to identify possible sources of contamination around your property or known contaminants in the water. Some areas are known to have naturally occurring contaminants such as arsenic, for instance. If the certifier thinks there is a chemical contamination they can ask for appropriate tests and water treatment.

Complaints: If a certifier gets a complaint or has specific information about contamination they are obligated to follow up in some manner. They might ask for more information, for a water test, or other kinds of tests.

Certifiers: If your certifier is asking for water tests don't be afraid to ask ques-

Veggie Regulations Demystified



Although there is no specific regulation for minimally processed ready-to-eat vegetables under the *Canadian Agricultural*

Products Act, these products must conform with sections 4 and 7 of the *Food and Drugs Act*. Section 4 states that: No person shall sell an article of food that has in or on it any poisonous or harmful substance; is unfit for human consumption; consists in whole or in part of any filthy, putrid, disgusting, rotten, decomposed or diseased animal or vegetable substance; is adulterated; or was manufactured, prepared, preserved, packaged or stored under unsanitary conditions. Section 7 states that: No person shall manufacture, prepare, preserve, package or store for sale any food under unsanitary conditions.

tions and to give them more information. You can ask what risk they are trying to identify. What is the certifier's policy and what guidelines are they going to use to evaluate the test? If you are doing things to mitigate risks from poor quality water (like using drip, stopping irrigation 2 weeks before harvest, treating water, not washing product, etc.) be sure to tell your certifier.

You can get access to the Canadian Horticultural Council's **On Farm Food Safety Guidelines** by contacting the COABC of-
fice, if you are certified by a member of COABC.

Much good information and references about water quality is available from Cyber-Help for Organic Farmers in Canada: www.certifiedorganic.bc.ca/rcbtoa and click on the link on the lower right that says On Farm Food Safety.

Credit: this Dear Rochelle was written in partnership with Sarah Davidson, who is currently the certification administrator for BCARA and has been a certification committee member for both BCARA and PACS and has been involved in many discussions of water quality and certification during the last 15 years.