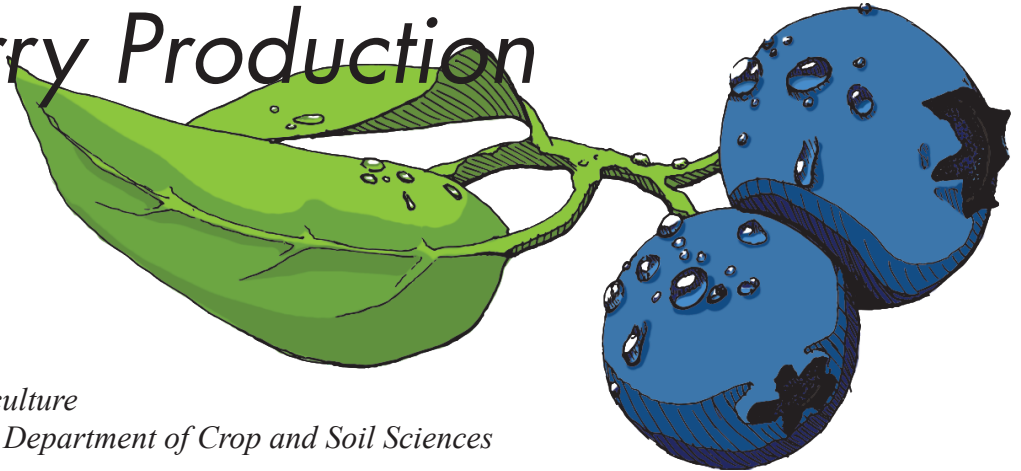


SAMPLING IRRIGATION WATER for Blueberry Production



Erick Smith, Department of Horticulture

Wesley Porter and Gary Hawkins, Department of Crop and Soil Sciences

The following is a checklist that may be used as a supplement to Circular 1105, “Blueberry Irrigation Water Quality,” which contains a detailed discussion on irrigation water quality for blueberry plants.

Irrigation water quality refers to the type and quantity of salts present in the water. Because blueberry plants are salt-sensitive, water testing at establishment and periodically throughout the life of the orchard is necessary to determine the effect of irrigation water on growth and development. Table 1 includes nutrients, characteristics, and thresholds that should be included in water testing for successful blueberry production.

Table 1. Water quality upper limits for blueberry production.

Test	Amount	Units
Electrical conductivity (EC) or salinity	0.45 - 1.0	dS/m or mmhos/cm
Total dissolved solids	250 - 640	ppm or mg/L
pH (acidity/alkalinity)	< 6.0	pH
Bicarbonate (HCO_3^-)	92	ppm or mg/L
Boron (B)	1	ppm or mg/L
Chloride (Cl^-)	142	ppm or mg/L
Sodium (Na^+)	46	ppm or mg/L
Calcium (Ca^{2+})	*	ppm or mg/L
Magnesium (Mg^{2+})	*	ppm or mg/L
Manganese (Mn^{2+})	**	ppm or mg/L
Iron ($\text{Fe}^{2+} + \text{Fe}^{3+}$)	**	ppm or mg/L
Potassium (K^+)	*	ppm or mg/L
Carbonate (CO_3^{2-})	*	ppm or mg/L
Sulfate (SO_4^{2-})	*	ppm or mg/L
Nitrate (NO_3^-)	*	ppm or mg/L

*No upper limits are presently available; however, to calculate nutrient application rate, lime deposition and sodium adsorption or sodium hazard, these nutrients are included in a standard irrigation water quality test.

**Iron and manganese can cause clogging in micro-irrigation systems through precipitation and acid injection may be required.

CHECKLIST FOR SAMPLING IRRIGATION WATER

Contact an accredited lab before water sampling and request a sampling kit for an irrigation water quality test. If necessary, have the water tested for microbiological levels. A food safety irrigation water quality test should include total coliform and E. coli counts along with irrigation water quality testing.

PREPARING YOUR SAMPLE CONTAINER:

- Read and follow all instructions to minimize contamination of your samples.
- Containers included in the test kit will be sterile, preserved, and/or clean. If you notice moisture or powder in the container, it is meant to be there: these containers have preservatives and should not be rinsed. Containers with preservatives need special precautions, so wear appropriate safety goggles and gloves when handling preserved sampling containers. Take caution not to overfill the containers.
 - If not using an approved laboratory container, use a new, clean plastic container with a screw cap and a minimum volume of 1 pint. Rinse the bottle at least three times with the water to be sampled. Avoid glass containers, as they can contain boron and break easily.

Sample early in the week to allow for tests to be completed within holding times, which are specified by the nutrient or microbiological test requested.

WELL WATER SAMPLING:

- Operate the pump for twenty to sixty minutes to ensure that the water being tested is representative of the water used for irrigation.
- Sample at the pump or closest outlet to avoid contamination from other components in the irrigation system.
- If multiple wells supply irrigation, flush the system for at least an hour, then sample. If a problem is indicated by the tests, each well will need to be tested separately.

Keep records, including date, time, and location of the sample.

SURFACE WATER RESERVOIR SAMPLING:

- Operate the pump for twenty minutes or longer, and take samples from a faucet near the pumping station.
- If no pump is present, attach a container to a pole that can reach beyond the rim reservoir and below the water surface. Collect many samples from around the reservoir and make a composite sample. The composite sample will be sent to the laboratory.
- If irrigating from sprinklers or a pivot, collect the sample from the point of emission.

SENDING THE SAMPLES TO THE LABORATORY:

- At sampling, tighten the cap on the container; dry the container; and record time, date, and sample location on the container. In addition, add any labels, chain-of-custody documentation, and any other laboratory-required information to the container.
- The laboratory may or may not require taping the cap shut. However, if mailing the containers, taping the containers shut can prevent leakage. Electrical tape works well to seal containers shut.
- When mailing, place the containers in a box and pack with loose, soft packing material to prevent crushing the containers.
- If unable to ship immediately, refrigerate the samples until they are ready to be sent to the laboratory.

HOW OFTEN TO SAMPLE:

- Surface waters may need frequent sampling, especially if contamination is suspected.
- Well water composition changes slowly, but testing is suggested every few years.

extension.uga.edu