



DEFINITION

Abundant, good quality water is critical for successfully raising livestock and obtaining high yields in crop production. Groundwater from wells and spring developments is often tested to determine physical, biological, and chemical characteristics.

PURPOSE

This practice may be applied as part of a conservation management system to determine the quality of a groundwater supply for the following intended uses: irrigation, livestock, fish and wildlife habitat, aquaculture enterprises, or other agricultural uses.

This practice does not apply to groundwater for human consumption, nor wells for monitoring groundwater hydrology or contamination associated with animal waste storage or treatment installations.

PRACTICE INFORMATION

Water quality parameters can be divided into three categories: physical, biological, and chemical. Parameters deemed suitable for livestock water purposes are not necessarily acceptable for growing plants. Physical properties that are critical for irrigation water include suspended solids and temperature. Suspended solids such as soil particles are potential problems since these particulates can clog irrigation nozzles and cause abrasion of irrigation equipment.

Water temperature can be an important consideration, particularly when growing foliage plants where high or low temperature can cause leaf spotting that reduces the value of these plants.

Chemical properties are typically given the most focus when dealing with irrigation water. From the grower's standpoint, the most critical chemical water quality parameters are soluble salts, hardness, sodium and chloride concentration, and pH. In a few cases, elements such as iron, boron, and fluoride are also considered critical parameters. Chemical properties, like physical and biological, may change significantly during a year, particularly as demand increases on the well and the water table is lowered.

Biological properties important to both livestock and irrigation water include algae, microbes, and disease organisms. Algae and microbes may cause clogging of irrigation system components.

The most common water quality problems affecting livestock production include high concentrations of minerals (excess salinity), high nitrogen content (nitrates and nitrites), bacterial contamination, heavy growth of blue-green algae and accidental contamination by petroleum, pesticides or fertilizer products. Blue-green algae is an occasional problem in freestanding water, such as farm ponds.

HOW TO COLLECT WATER SAMPLES

There are two important factors to remember when collecting water samples: avoid contamination of the sample with any foreign material, and make sure the sample represents the supply and arrives at the laboratory unchanged. Samples may be sent to any accredited commercial or state-operated laboratory for analyses. The University of Arkansas Water Quality Laboratory (479-575-7317) can provide assistance in selecting appropriate tests and interpreting results.

1. Use a clean plastic container (most laboratories will furnish containers and sampling instructions). **RINSE SEVERAL TIMES unless the sampling instructions specifically say not to rinse** with the water being sampled. Be certain the cap or lid is also clean. Follow any sampling instructions provided by the laboratory. If the sample cannot be sent immediately after collection, then freeze it before sending to the laboratory.
2. Wells should be pumped at least 24 hours before sampling. It is best to sample irrigation wells during the peak of the pumping season.
3. Dependable sampling of irrigation test wells can be done only after a pipe and screen is installed and after pumping out all water added during the drilling operation (ideally for at least 24 hours).
4. Samples of springs, streams or ponds should be taken from below the surface where possible.
5. **An analysis for iron** typically requires a separate sample. Accurate iron tests can be made only if the sample is acidified immediately. Most laboratories can provide a container with sufficient acid added to acidify the sample. Contact your county Extension agent for instructions, or request instructions when submitting a sample for one of the standard irrigation water tests.

ADDITIONAL ASSISTANCE

Technical assistance is available through your local Field Service Center of the USDA Natural Resources Conservation Service (<http://www.ar.nrcs.usda.gov/>); the Arkansas Cooperative Extension Service, (501) 671-2000 or <http://www.uaex.edu>; and the University of Arkansas Water Quality Laboratory, (479) 575-7317 or E-mail at awrc@uark.edu

An “INFORMATION SHEET FOR WATER ANALYSIS” form is available online at <http://www.uark.edu/depts/awrc/waterqualitylab.html> that should accompany any samples submitted to the University of Arkansas Water Quality Laboratory.