

Irrigation Water Sample Analysis

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Soil-Water Compatibility Recommendations

The NDSU Soil and Water Testing Laboratory has been making soil-water compatibility recommendations since the early 1960s. These recommendations are based on the electrical conductivity (EC) and sodium adsorption ratio (SAR) determined on the irrigation water and the soil series present on the land to be irrigated.

Soil surveys of every county in North Dakota have been completed and documented. Many counties have printed copies, but official, up-to-date soil survey information can be found only on the Internet at <http://websoilsurvey.nrcs.usda.gov>. Your local NRCS or county Extension office can help you obtain soil series information for your fields.

For more information on this and other topics, see www.ag.ndsu.edu

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County Commissions, NDSU and U.S. Department of Agriculture Cooperating. This publication will be made available in alternative formats for people with disabilities upon request. (701) 231-7881.

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Each soil series in North Dakota has been classified as either unsuitable for irrigation, conditional or irrigable. The irrigation classification for specific soils can be found in AE-1637 Compatibility of North Dakota Soils for Irrigation (www.ag.ndsu.edu/publications/crops).

Soil-water compatibility recommendations are made based on how high the irrigation water salinity and sodicity are relative to the tolerance limits of the soils to be irrigated. For example, we may have an irrigation water with an EC of 1585 $\mu\text{mhos/cm}$ and an SAR of 5.9. We could use this water on a soil such as a Hecla, which has tolerance limits of 3000 $\mu\text{mhos/cm}$ for EC and 12 for SAR. On the other hand, this water would not be compatible with a Bearden soil, which has tolerance limits of 1500 $\mu\text{mhos/cm}$ for EC and a SAR of 6.

Soil-water compatibility determinations should be done before irrigation systems are established. Failure to obtain compatibility recommendations can result in soil hardening, becoming impenetrable and losing productivity.

Even where soil-water compatibility recommendations have been obtained, and soils and water have been found to be compatible, soils should be sampled to a minimum depth of 6 feet in 1-foot increments and analyzed for pH, EC and sodium. This should be done before irrigation commences in a field and again every three to five years. This allows the irrigator to monitor any detrimental changes that may be occurring due to irrigation and become

problems before they cause major soil degradation.

Soil-water compatibility recommendations can be obtained for \$50 from the Soil and Water Testing Laboratory at North Dakota State University with the submittal of a water sample and legal description of the field to be irrigated. **Use the form on the reverse side of this sheet.**

A soil-water compatibility recommendation for irrigation can only be as good as the information supplied.

Please fill out the reverse side completely.

Note:

Water to be used for drinking is tested by the North Dakota Health Department Laboratory at Bismarck, N.D. Water to be used for livestock is tested by the Veterinary Science Department at North Dakota State University in Fargo, N.D.

Sampling Instructions

Use a clean $\frac{1}{2}$ to 1 pint bottle. **DO NOT** use a bottle which contained any chemicals such as bleach or agricultural chemicals. Rinse container several times with the sample water before filling. If sample is from a well, pump the well for 10 to 15 minutes in order to obtain a uniform sample.

Irrigation Water Sample Analysis Form

Name _____

Date ____/____/____

Address _____

Phone _____

E-mail _____

Birthdate ____/____/____

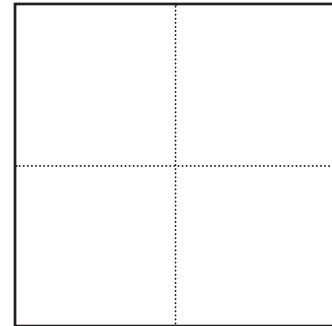
Location of area to be irrigated:

Township No. _____ Range No. _____ Section No. _____ Quarter _____

County _____

Indicate irrigated area
and water source
(with an X) on the section map

- Water Source:**
- Farm well
 - Irrigation test well
 - Irrigation production well
 - Depth of well _____ ft
 - Other sources, please specify



Kind of Soil: Has a soil suitability for irrigation map (ND Soil 8 Form) been prepared by the Natural Resources Conservation Service? Yes No

If mapped, send copy with water sample.

If soil has not been mapped, make sure the location of land to be considered for irrigation is clearly stated above so the best available soils information can be used for the recommendation.

Would you like a recommendation? Yes No

Expected Use: Irrigation: field scale _____

Irrigation: lawn and/or garden _____

Other _____

Crops to be grown _____

Soil and Water Testing Laboratory • phone (701) 231-8942

US Mail:

NDSU Dept. 7680
P.O. Box 6050
Fargo, ND 58108-6050

FedEx, UPS, etc.:

103 Waldron Hall
1360 Bolley Drive
Fargo, ND 58102

Cost:

- \$35 per sample **without** recommendations (analysis only)
- \$50 per sample **with** recommendations (analysis and recommendations)