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NF93-140 Water Management for Irrigation in Nebraska

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This publication outlines our current recommended goals and techniques to manage water for irrigated crops in Nebraska. More information concerning the outlined techniques can be found in the listed publications.

Goals for Water Management in Irrigation

- To conserve surface and groundwater supplies.
- To minimize surface and groundwater contamination.
- To efficiently use precipitation and irrigation for crop production. To apply irrigation in a manner that stores water in the crop's active root zone and minimizes percolation of water below the root zone.

Techniques to Achieve Goals

- Schedule irrigations with appropriate amounts and frequency.
- Measure current soil water status, rainfall, and irrigation water applied to a field.
- Obtain regional information on evapotranspiration (crop water use).
- Balance rainfall and irrigation applications with crop water use.
- Choose the amount of water and the time to apply water based on availability of storage in the active root zone and the needs of the crop.
- Apply water uniformly by sprinkler irrigation without runoff in the field.

- Match center pivot systems and sprinkler devices to soil intake rates and terrain.
- Schedule irrigations properly.
- Probe soil 1 to 2 days after irrigation to determine penetration of applied water and uniformity of application.
- Modify irrigation system and tillage management as necessary to improve application uniformity and efficiency, including basin tillage, crop residue management, sprinkler device selection, and system operation.
- Apply water uniformly by furrow irrigation.
- Adjust stream size and set time to achieve more uniform penetration of water.
- Schedule irrigations properly.
- Probe soil 1 to 2 days after an irrigation set to determine penetration of applied water and uniformity of application. Adjust stream size and/or set time to improve next set.
- Modify irrigation system and tillage management as necessary to improve application uniformity and efficiency, including runoff recovery systems, semi-automation (SURGE) and improved land grading.

Equipment and Information Needed for Water Management in Irrigation

- Properly designed and maintained irrigation system for efficient and uniform water delivery.
- Irrigation water measuring device for each field to determine irrigation application.
- Rain gauge for each field to credit rainfall in soil water balance.
- Soil probe and/or other monitoring equipment for checking soil water content and irrigation penetration. Source for crop water use information to determine irrigation amount and timing.

Information Sources for Water Management in Irrigation

EC91-735, *The Impact of Nitrogen and Irrigation Management and Vadose Zone Conditions on Ground Water Contamination by Nitrate-Nitrogen*

Schedule irrigations properly and apply appropriate amounts.

G78-393, *Water Measurement Calculations*
G78-392, *Selecting and Using Irrigation Propeller Meters*
NF91-39, *Precipitation and Irrigation Monitoring for Managing Irrigation Scheduling*
G92-1099, *Estimating Effective Rainfall*
G90-964, *How Soil Holds Water*
G84-690, *Estimating Soil Moisture by Appearance and Feel*
EC89-724, *Irrigation Scheduling Using Tensiometers in Sandy Soil*
EC89-723, *Irrigation Scheduling Using Moisture Blocks in Silty Soil*
G90-992, *Evapotranspiration (ET) or Crop Water Use*
G85-753, *Irrigation Scheduling Using Crop Water Use Data*
G82-602, *Predicting the Last Irrigation for Corn, Grain Sorghum and Soybeans*
G86-826, *Irrigating Alfalfa*
G78-398, *Irrigated Small Grain Production*
G84-686, *Irrigating Dry Beans*
G83-659, *Irrigating Onions*

Apply water uniformly by sprinkler irrigation without runoff in the field.

G89-932, *Minimum Center Pivot Design Capacities in Nebraska*

G88-870, *Selecting Sprinkler Packages for Center Pivots*
G91-1043, *Water Runoff Control Practices for Sprinkler Irrigation Systems*
G88-888, *Flow Control Devices for Center Pivot Irrigation Systems*
G93-1154, *Crop Residue and Irrigation Water Management*

Apply water uniformly by furrow irrigation.

G91-1021, *Managing Furrow Irrigation Systems*
G91-1018, *Fundamentals of Surge Irrigation*
G91-1017, *Application of Surge Irrigation*
NF93-118, *Fine Tuning Furrow Irrigation Systems*
G93-1154, *Crop Residue and Irrigation Water Management*
NF94-176, *Surge Irrigation*
NF94-177, *Nebraska Surge Irrigation Trials*
NF94-179, *Surge Irrigation Management*

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