

# Drainage Water Management Fact Sheet

## Historical Perspective

Traditionally, subsurface or tile drainage has made profitable crop production possible on the Nation's flatter landscapes. An unwanted consequence of this activity is that excess nutrients (nitrates and phosphorous) potentially get into rivers and streams from tile drain water, which may negatively impact the environment.

Drainage Water Management (DWM) is a practice used by farmers with flat landscapes (.5 or 1% slopes and flatter) to reduce nutrients in runoff from their farms. Producers and landowners in the Red River Valley may experience the greatest benefits from DWM in North Dakota.

This practice uses existing tile systems to make them part of the environmental solution, and not a potential problem.

NRCS conservation specialists and Technical Service Providers (TSP) can assist landowners by helping develop their DWM plans.

## What exactly is DWM?

DWM is an NRCS conservation engineering practice. It is a combination of structures and managements designed to hold water in the root zone when crops need it and release it when there is excess.

More specifically, DWM manages the timing and amount of water discharge from agricultural drainage systems. The practice is based on the premise that identical drainage intensity is not required at all times during the year.

Water quality benefits are realized by minimizing unnecessary tile drainage events, thereby reducing the amount of nitrogen and phosphorous that leave the fields. DWM systems can also retain water needed for late season crop production.



Picture depicts excess water being released through DWM.

Photo by USDA-NRCS

DWM systems work best on very flat ground--a fact that reduces the potential management benefits on farms with steep or sloped soils. Even so, DWM still offers valuable benefits to many North Dakota landowners.

The bottom line: Agricultural producers can use DWM to help mitigate potential adverse impacts tiling may have on the environment. DWM removes excess water out of the soil profile and holds it for later crop use. It is a win-win for producers.

*DWM is an approved NRCS conservation practice that enhances tile drainage by giving producers the ability to simultaneously manage their tile system for crop production and environmental conservation.*

## How does DWM work?

To make it possible for producers to truly manage water table levels, they need to retrofit an existing tile system with an appropriate water control structure. Each structure controls an elevation-defined area; one that is

based on field topography and the existing tile system layout. Water control structures come in various designs, depending on the size and layout of the tile system. Check with your TSP or tile installer for options that may work best for your situation. Here is an example plan for a riser type design. Instructions include:

1. Prior to seedbed preparation, remove riser boards to drop water table levels prior to tillage/planting operations.
2. During the growing season, stack riser boards to raise water table high enough to provide capillary water to crop root zone.
3. Before harvest, remove boards to lower water table.
4. After harvest, raise water table to hold nutrients in the field/soil over winter.

A DWM plan considers and incorporates the landscape (soils, slope, and topography) cropping system, nutrient management, and current (or planned) drainage systems.

## How will a DWM Plan benefit my current tile drainage operation?

Successfully incorporating DWM into the design and installation of a new or existing tile drainage system requires careful planning. Moreover, an effective DWM system can help landowners and operators to:

- ~ Protect and improve water quality
- ~ Potentially enhance crop production
- ~ Improve soil productivity and carbon sequestration
- ~ Reduce soil erosion and loss of valuable soil and nutrients
- ~ Provide seasonal shallow water for wildlife habitat

## What's in a DWM Plan?

A properly prepared DWM plan ensures factors of landscape, soils, slope, and current drainage systems are taken into consideration and incorporated into the function of a DWM system. A typical DWM plan would include:

- ~ Farm and field identification
- ~ Landowner goals and objectives
- ~ Detailed topographic map
- ~ Soil map and soil profile information
- ~ Field maps with field boundaries and sensitive resource areas
- ~ Tile map, outlets, and control structure locations
- ~ Crop system description, risk assessments, and a nutrient management plan

- ~ Operational and maintenance instructions

DWM plans provide the location and design of each planned water level control structure to maximize the benefits of the DWM system.

*Your DWM plan will have to be prepared by a private TSP (must have a P.E. license). When applying for NRCS assistance, landowners and operators are more likely to be funded if they have a DWM plan in place.*

## What is the expected outcome of a DWM Plan?

The expected outcomes from the adoption of a drainage water management plan and its associated conservation practices include the following:

- ~ Improved water quality
- ~ Reduced sediment and nutrient discharge

- ~ Reduced volume of water downstream
- ~ Improved crop production efficiencies
- ~ Improved soil quality

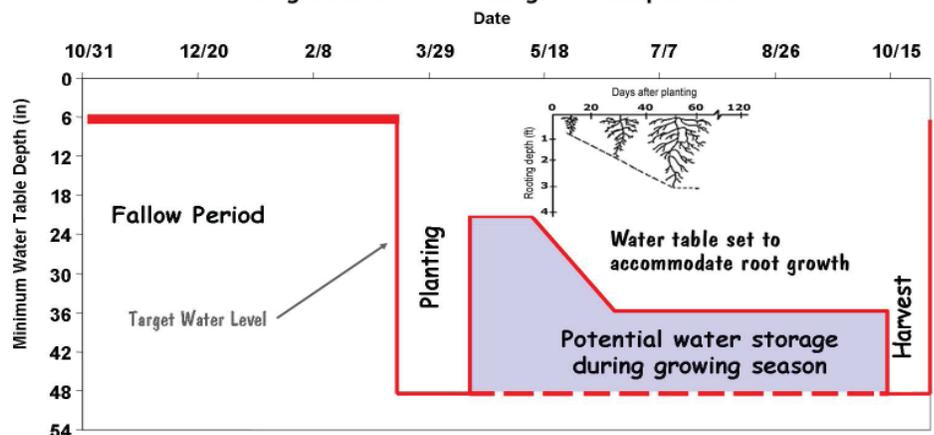
## Financial Assistance is Available for DWM!

To achieve the diverse array of environmental benefits possible with DWM, private landowners and operators may be eligible for technical and financial assistance.

North Dakota farmers may receive assistance to create a drainage water management plan, install control structures, or manage the control structures throughout the year.

For more information about DWM, please visit your local NRCS service center or visit us on the web at [www.nd.nrcs.usda.gov](http://www.nd.nrcs.usda.gov)

Target Water Level Settings — Example Plan



Picture depicts how a water level control structure allows for management of the tile outlet elevation.

Photo by USDA-NRCS