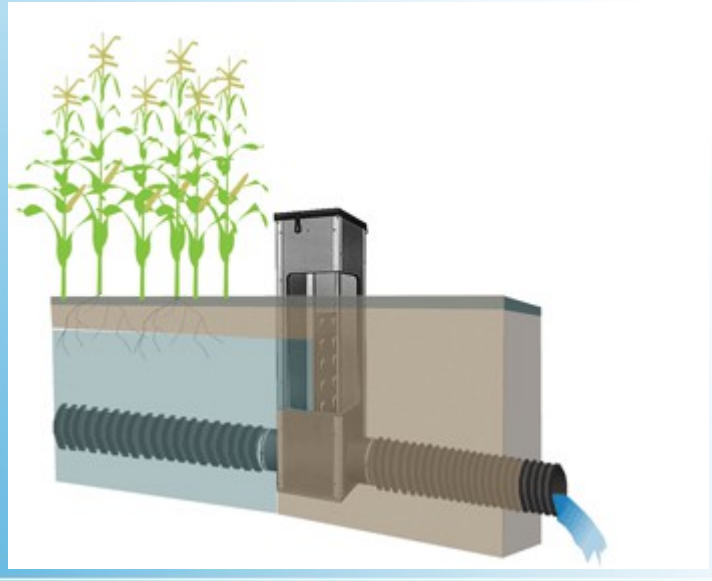
Drainage Water Management
Shallow Tile Design

How can it help?



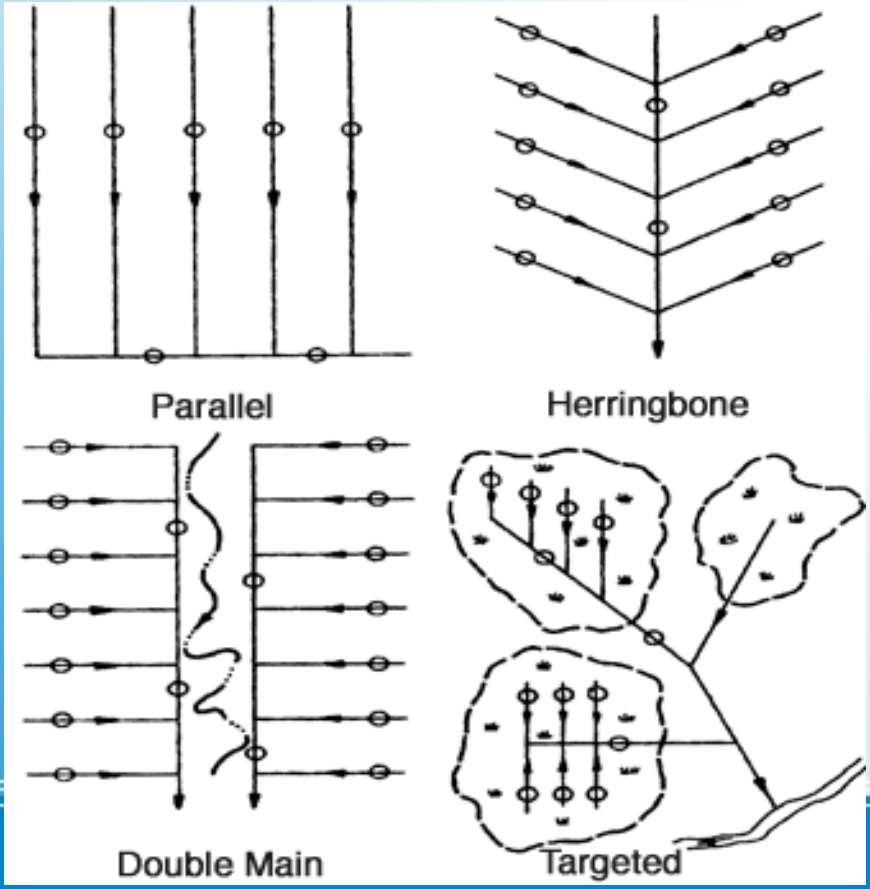
Before we talk about Controlled Drainage or Drain Water Management.
let's talk briefly about conventional farm drainage.

Tiling or Farm Drainage provides a way for water that otherwise is trapped in the soil to "drain" away allowing the soil to be used in a productive manner.

Most tile being installed today is plastic.
It's generally plowed or trenched in using laser
Or GPS for grade control.

Subsurface drainage tile makes profitable crop production possible on Iowa's flatter landscapes.

Conventional drainage systems generally followed these basic designs



By Definition:

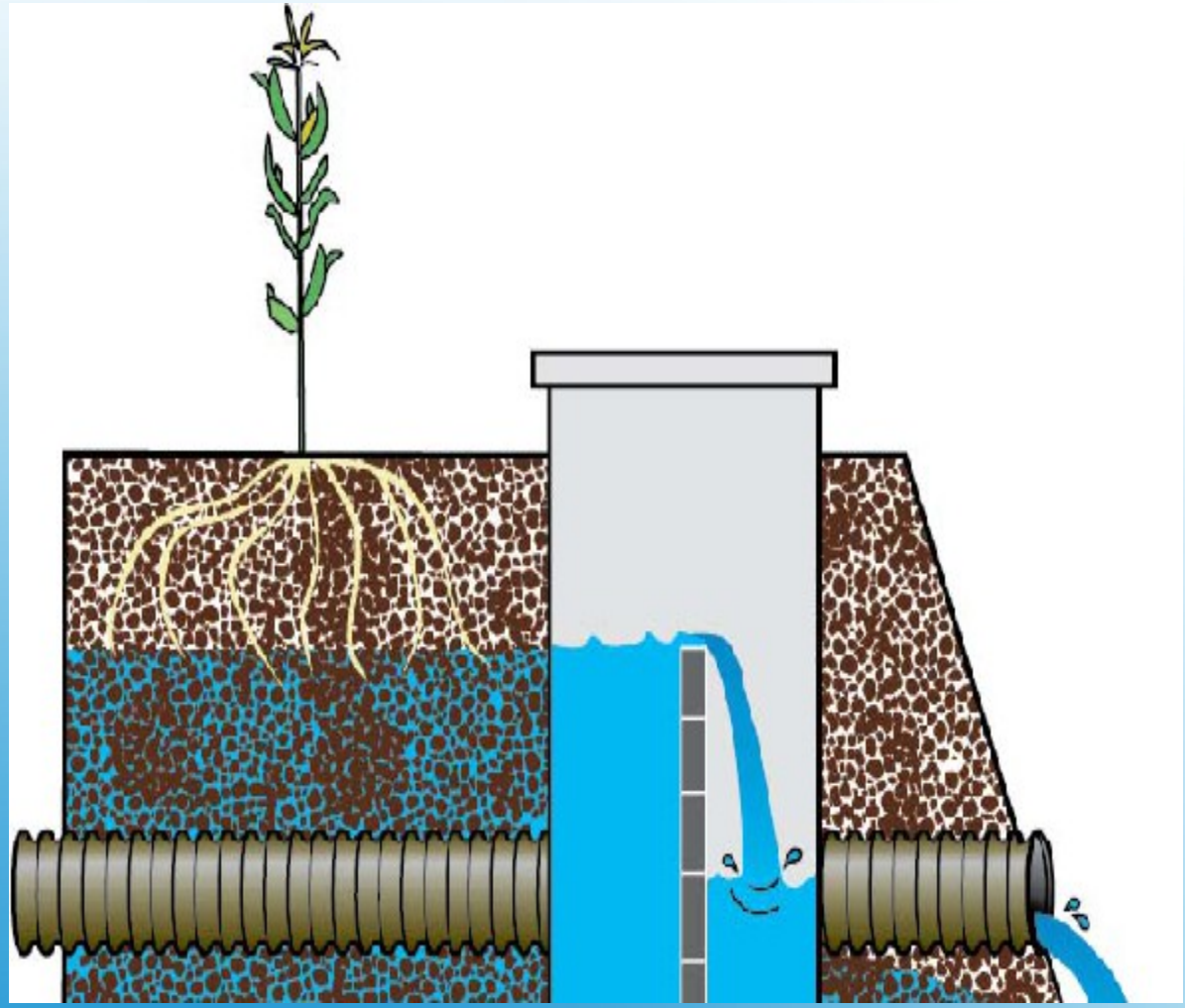
Drainage Water Management is:

A process of managing water discharged from surface and/or subsurface agricultural drainage systems

DWM allows farmers with subsurface drainage tile to hold water in root zones when crops need it and drains it when there is too much. It manages the timing and amount of water discharged from agricultural drainage systems

With appropriate management, DWM systems may also retain water needed for late season crop production.

The NRCS Practice Standard 554, entitled "Drainage Water Management," provides guidance to landowners who want to use "control structures" to reduce water flow and nitration loading from their subsurface tile and drain systems during the non-growing season. Reducing these flows during the fallow season, producers can reduce nitration loadings by 30 to 60 percent. Producers would also benefit from less runoff of their fertilizer inputs.



Typical flow control structure

How It Works

Each structure controls an elevation-defined area, based on the lay of the land and the tile system layout already in place.

Structures are small, reasonably priced, and operating instructions are fairly simple. For example, a farmer would need to make about six trips per year to adjust control structure elevation in a 75-acre field with five control structures.

Water level elevations are adjusted using riser boards. Following is what a farmer might expect for annual operation and maintenance:

Remove riser boards to drop the water table levels about 10 days prior to planting and before any spring tillage.

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During the growing season, stack riser boards to potentially raise the water table high enough to provide capillary water to the crop root zone.

Before fall harvest, if needed, remove boards to lower the water table 10 days before fall fieldwork.

After harvest, install riser boards to potentially raise the water table up even further – near the ground surface – to hold water and nutrients in the field and soil over winter.

What is the purpose or objective in Implementing a Drainage Water Management plan?

1. Improve water quality
2. Improve the soil environment for vegetative growth
3. Reduce the rate of oxidation of organic soils
4. Prevent/reduce wind erosion
5. Enable seasonal shallow flooding or surface watercourse flows for fish and wildlife habitat

Why design for “Shallow” tile ?

What does that mean?

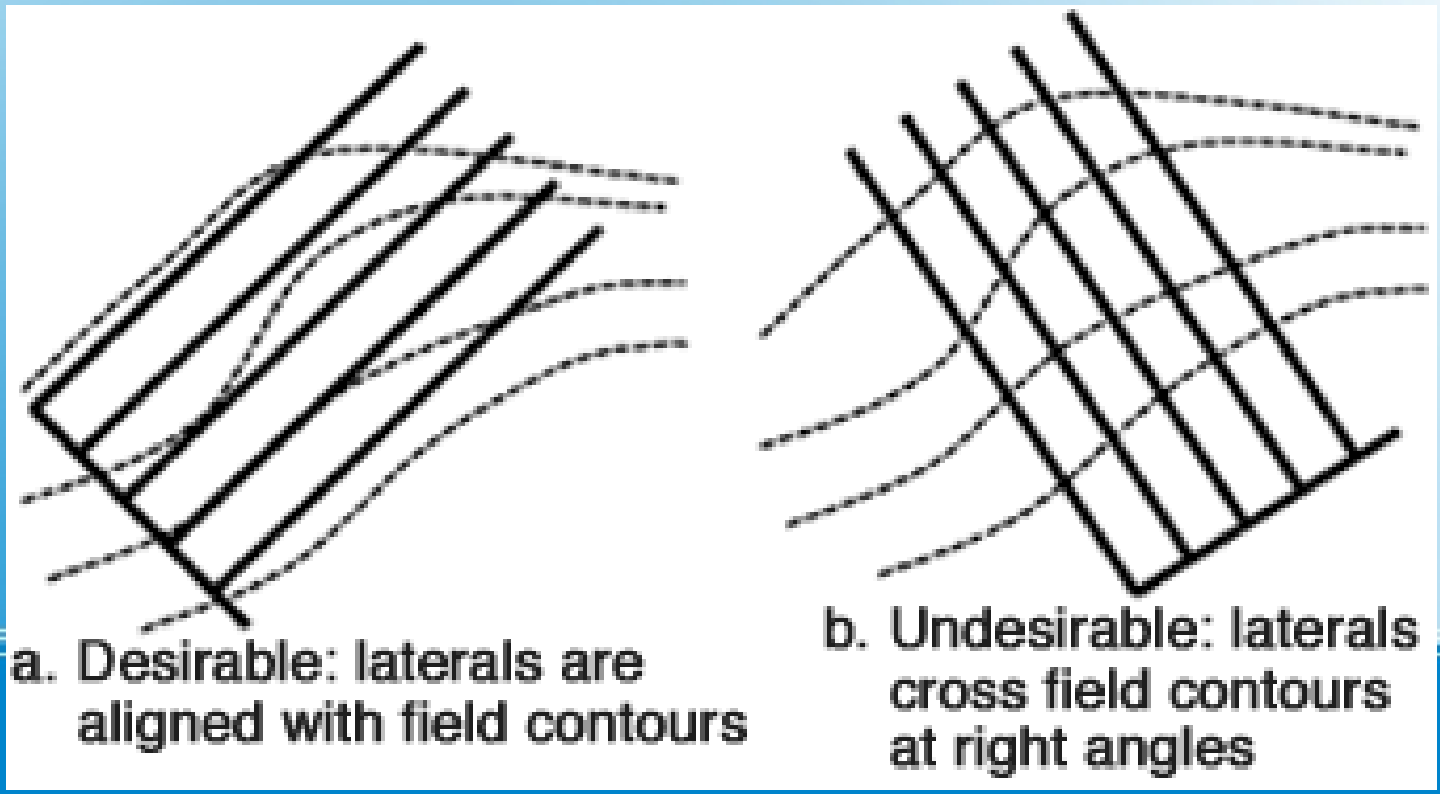
Tile not installed as deep

Tile installed with narrower spacing

Tile installed along the contours
in rolling topography

Why does any of this matter?

Why not just start tiling at the bottom and go up hill?



a. Desirable: laterals are aligned with field contours

b. Undesirable: laterals cross field contours at right angles

Drainage Water management using control structure's, need a relatively flat topography. Usually less than .5 percent.

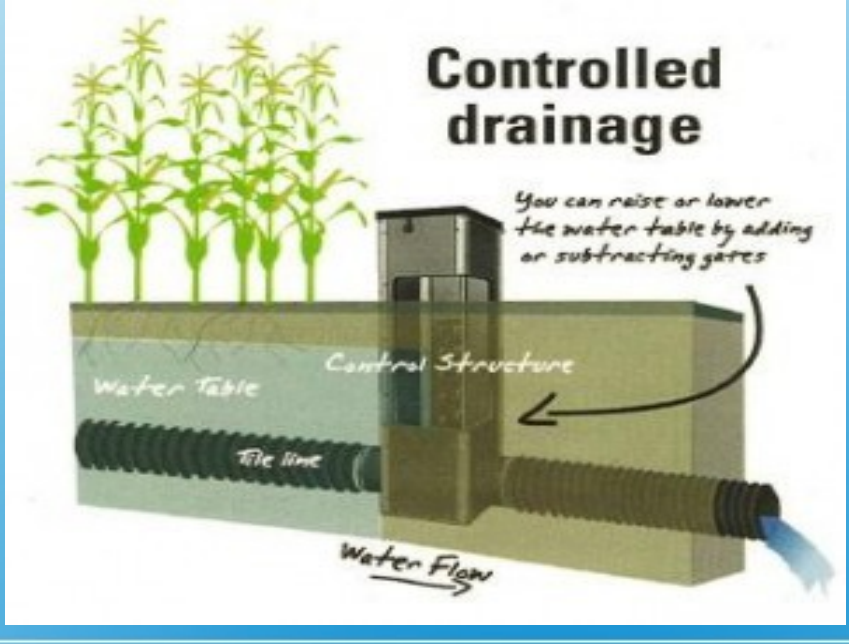
This allows for larger management areas. Where the water table can be managed within one to two feet.

In areas with greater slopes, shallow drains with narrow spacing laid out on the contours can reduce the total water leaving the field thus reducing the total nitrate delivery to the watershed

Planning an effective drainage system takes time and requires consideration of a number of factors, including:

* Local, state, and federal regulations
* Soil information
* Wetland impact
* Adequacy of system outlet
* Field elevation, slope (grade), and topography assessment
* Economic feasibility
* Present and future cropping strategies
* Environmental impacts associated with drainage discharge
* Easements and right-of-ways
* Quality of the installation

Drainage Water management, whether using Control Structures, and Shallow drainage practices, or other practices such as Bio-reactors, and treatment wetlands, can and will reduce nitrate levels in downstream watersheds.



When your planning your next drainage project whether you are doing it yourself or hiring it done. Do the research, take the time to plan, design and install a system that not only increases your lands productivity and value, but also helps improve our water quality.

Questions?

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