Drainage Water Management (DWM): Re-thinking Tile

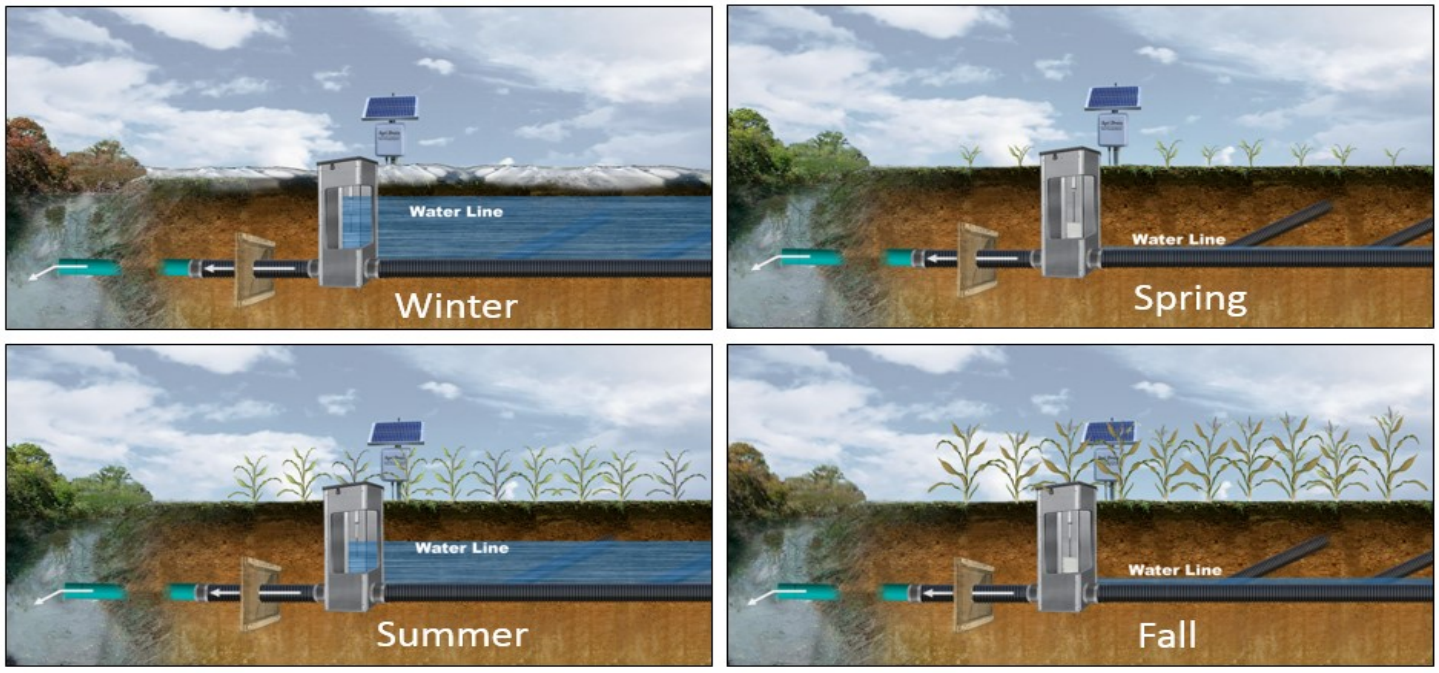
With the uncertainty of todays weather patterns, many farmers are searching for other ways to maintain some control over their cropland. Wet springs these past couple of years, has left many landowners looking to invest into pattern tile drainage for many of their cropland acres to help combat the excessive moisture. Recently, a modern drainage technique has been developed that provides the same aspects of traditional pattern tile but with added benefits of greater water quality and a potential for increased crop yields. As landowners are taking a serious look into adding drainage tile to their acres, they should really be considering drainage water management for their water control strategy.

Drainage water management (DWM) is the practice of using water control structures within a pattern tile system to control the drainage outlet at varying depths. This allows farmers to have more control over their drainage, giving them the ability to not only drain a field during planting or harvest, but also to retain water for crop use during the growing season. A DWM system can help to reduce as much as 15-75% of nitrates entering into surface waters, as well as provide a safety cushion for crops during periods of drought. Land managers can control water levels based on the crop rooting depth or release the water as needed during excessive or heavy rainfall events. Research has shown a properly managed DWM system can even help to boost yields by 5% or more. A DWM system can be designed as new drainage network or it can be retrofitted into existing pattern drainage with some limitations based on the pre-existing layouts and grades.

The ideal landscape for a DWM system is flat to gently sloped cropland that has an adequate outlet. A single outlet control structure can effectively control 10-20 acres of drainage, multiple control structures can be used within a system. A typical outlet control utilizes stacked planks or gates that can be manipulated by the land manager within the structure housing. Additional "in-line" control structures are often buried upstream of the main outlet which provide the ability to control higher elevations, usually in 1' increments. Farmers can manually set the water levels or utilize the newer automatic technology that has become available for DWM systems.

Overall, the cost of installing a DWM system is relatively low, assuming grades are flat enough for one structure to control 20 acres, initial costs range from $20 to $110 per acre. Because of it's great conservation benefit to water quality, there are many free resources available to landowners who are interested in the design and potential financial assistance for installing DWM systems. The USDA-NRCS and Ecosystems Services Exchange have developed a partnership to assist landowners with the implementation of drainage water management systems. For free DWM design assistance for new and retrofitted systems, as well as program recommendations, landowners can take the first step towards by contacting the Sibley County USDA-NRCS at 507-237-5435.

(Below: Images depicting a typical drainage water management control structure during each season of the year.)



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Sources: Drainage Water Management for the Midwest (*Authors:* Frankenberger, Kladivko, Sands, Jaynes, Fausey) https://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1000&context=abe_eng_extensionpubs