

# Agricultural Tile Drainage: Helping or Hurting the Red River Valley?

***“It ain’t what you don’t know that gets you into trouble. It’s what you know for sure that just ain’t so.”***  
- Mark Twain

It’s hard not to be reminded of this sage Mark Twain observation when watching North Dakota struggle continually with water management issues and the relationship between agricultural drainage and flooding.

When nearly every spring in the Red River Valley’s recent history has meant a flood, and midsummer river levels above flood stage are not uncommon, it’s logical that people begin to examine anything and everything that could be contributing to this recurring problem. Subsurface agricultural drainage, commonly referred to as tile drainage, has drawn a lot of attention. A long wet cycle in the Valley has spurred extensive producer interest in this practice, which uses subsurface plastic pipes, or drain tiles, to remove excess water from the soil, allowing farmers to get into their fields during times when portions of their fields have been too wet to do so.

While tile drainage has been practiced for decades in several neighboring states, it is in its infancy in North Dakota. But, like every other issue dealing with agriculture and water management in the state, there are proponents of the practice, as well as those whose unanswered questions lead them to be not as eager to expand this practice in North Dakota.

## ***Claims of Benefits***

As one would expect, agricultural producers who benefit from tile drainage and many farm groups are in favor of tile drainage because it allows producers to be able to farm traditionally farmed areas that have become saturated due to excess moisture from the current wet cycle. “Tile drainage makes the land more productive,”

says Woody Barth, vice president of the North Dakota Farmers Union and a producer from the Solen area. “With the high price of land, farmers need all the help they can get to make their land as productive as possible to cover these costs.” Barth also says tile drainage can improve the health of the soil by moving water from a saturated area, thus reducing the salinity of the soil.

Claims have been made that tile drainage improves the quality of the water that ends up in streams and other waterways by filtering chemicals and nutrients through the soil rather than allowing the water to run over the surface, picking up all the chemicals in its way.

“In some instances that may be the case,” says Keith Trego, executive director of the North Dakota Natural Resources Trust. “Credible research does support the claim that percolation of water through soil does remove some of the agricultural chemicals such as herbicides and pesticides, but highly water soluble nutrients like nitrogen, for example, are another matter. Nitrogen tends to go where the water goes, and the amount that flows from drainage tile depends upon a host of variables unique to each situation.

## ***Is Tile Drainage Flooding the Valley?***

Because flooding has been commonplace in the Red River Valley for the past 18 years, some residents are concerned about whether tile drainage is contributing to this problem. Barth says he doesn’t think there is a link between flooding and the increased use of tile drainage. “It’s just a result of heavy rains and saturated soils, and the extreme wet cycle we are in,” he says. He goes on to say that some tiling projects can actually hold water during peak flows and heavy rain events and release it at a time when flows aren’t as high.

Trego agrees with the concept that tile drainage systems can hold water during periods of high water, but says there

is lack of clarity about requirements for things like water control structures, for tile drain lines to be documented with GPS locations filed with a public approving entity, and other potentially beneficial practices. In addition, volume and timing of flows from tile drainage systems can be dramatically different than surface flows. Whether that difference is beneficial or detrimental is also subject to numerous variables.

State Water Commissioner Harley Swenson points out one of the concerns of altered flow regime. “Approval authority brings with it responsibility,” Swenson says. “Who is going to be responsible for maintenance of existing drainage ways accepting tile drainage water when they now might be wet most of the year?”

In addition to questions about regulating the timing and volume of outflow from tile drains, water quality issues and drain maintenance issues, another issue is whether or not tile drainage will affect wetlands.

“Historic tile drainage in other parts of the country prior to 1985 was done without regard to wetland impacts,” Trego says. “In fact, most tile drainage in states like Iowa was done specifically to drain wetlands, to obliterate their presence and functions from the landscape. Things are different today; we’ve learned a lot about the value of wetlands and have laws and public policy that reflect that understanding and protect wetlands. While there is a process of assessing and avoiding wetland impacts, and where that is not possible mitigating for those impacts, it is not a perfect system. The intensity at which tile drainage is

being promoted and installed puts pressure on the process designed to identify and protect wetlands.”

### ***Ready, Fire, Aim***

“Public policy surrounding water management in all its forms is important to every citizen of North Dakota and a well-crafted regulatory structure is critical when flooding is a serious concern,” Trego says. “The increased use of this practice is being encouraged before studies can be done to determine if this practice is making the flooding better or worse. Before we promote, streamline, and speed up the tile drainage approval process, it seems logical that we have a better idea of the impacts of these projects.

“When the communities of Fargo and Moorhead are projecting a public cost approaching \$2 billion to build a diversion to assist with their flooding problems, we should assess if tile drainage projects are impacting flooding. It seems like good public policy would be to wait to proceed with tile drainage projects until we know the answers to these questions. But rather, the train to an unknown destination has already left the station and is rapidly picking up speed.”

Earlier this year, two bills dealing with tile drainage on the state’s agricultural land were passed in the North Dakota legislature. In a nutshell, House Bill 1459 states that any tile drainage under 80 acres does not need a permit. The bill gives permitting authority to local water resource districts, which can attach any necessary conditions to a permit (such as requiring water control





Installing drainage on agricultural land.



A double-lift tile drainage system.

structures), but cannot deny a permit unless the tile drainage project is of statewide significance or if an investigation shows that the proposed drainage would flood or adversely affect downstream landowners within one mile of the project.

Senate Bill 2342 called for a study in the interim to look into the impacts of tile drainage. While this bill did pass, it was not chosen as one of the interim studies.

Barth worked closely with the legislature on both bills and feels they are very beneficial to the state, helping define when a permit is needed, and giving control over the permitting process to local water boards, which he says is a good fit because the members of these boards live in the areas and know it best.

Whether or not the one mile impact to downstream landowners is a sufficient distance was discussed at length during the legislative session, Barth says. “One mile is just a starting point that came from what other states that have been constructing tile drainage projects for many years are doing. These states have found that flows beyond one mile of a tile drainage project are the main flows that would have been there anyway, but because North Dakota has its own unique landscape and soil properties, we don’t know for sure if this will be sufficient until the projects have been constructed and we can observe their impacts. If there are negative impacts directly related to the projects, that distance can be tweaked during the next legislative session.”

Trego says one of the main concerns about tile drainage projects is that legislation such as HB 1459 speeds up the permitting process, allowing projects to proceed without any definite answers about whether it contributes to downstream flooding, what affects it has on downstream water quality, and how these watersheds will respond to the projects. “There are many guarantees about these things by proponents of tile drainage, especially equipment dealers and those who install the tile drainage projects. Until there is good scientific evidence one way or the other, we should

really proceed with caution.”

### *A Sensible Step*

As a result of these questions and concerns, the Red River Retention Authority has hired the International Water Institute to establish a Basin Technical and Scientific Advisory Committee (BTSAC) to technically and scientifically investigate the impacts of tile drainage in the Red River Valley so officials can better manage the area’s water resources.

BTSAC is made up of stakeholder representatives from the region’s cities, water resource districts, environmental organizations, universities, and state and federal natural resource agencies. These representatives are charged with reviewing literature, developing study plans, and conducting scientific research to determine whether or not tile drainage affects peak flows in the Red River Valley.

Chuck Fritz, director of the International Water Institute says BTSAC and its technical committees have reviewed 48 public documents thus far, and based on their research, they strongly discourage any statement saying tile drainage either does or doesn’t affect flooding because, at this point, it is scientifically unknown.

“The cumulative effects of tile drainage will not be known until the projects are done and it all plays out. My hunch is that a substantial amount of tile drainage won’t affect anyone, but some may. There is no doubt that tile drainage is good for agriculture – that has been clearly documented, but what it means for the watershed as a whole has yet to be determined. Therefore any statement, whether for or against tile drainage about flooding impacts, has not been scientifically proven and is simply opinion rather than fact.”

Whether for or against tile drainage in the Red River Valley, it is happening. Next month’s “Prairie PONDerings” article will examine how producers who wish to tile their fields can carry out this practice in the most responsible ways possible.