

## FIXING TILE BLOWOUTS: WHAT YOU NEED TO KNOW!

Eric Cooley<sup>1</sup>

Tile blowouts in Wisconsin are increasing in prevalence as older clay and concrete tile drainage systems continue to age. The gradual expansion of tile lines to an existing system, without proper resizing or venting, has only exacerbated this problem. Sinkholes caused by tile blowouts can introduce soil and nutrients into the tile drainage system and increase the potential for nutrient loss and tile blockage (Fig. 1).

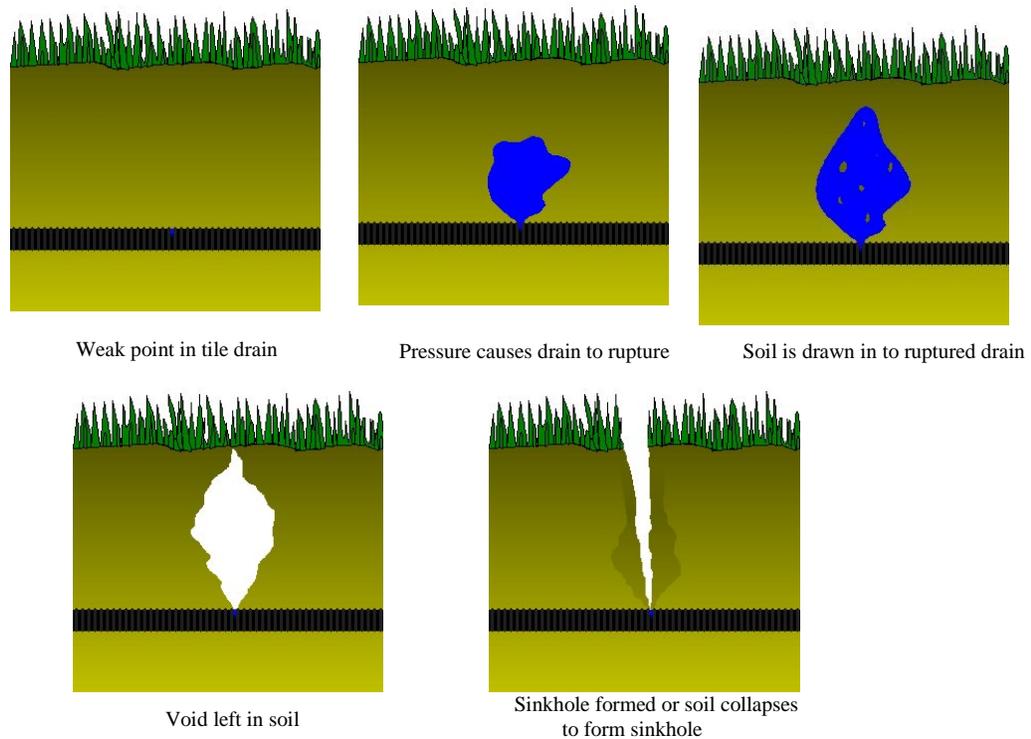


Figure 1: The sequence of steps forming a sinkhole from a tile blowout

Blowouts result from excessively high flow velocity or pressure inside the tile, causing it to crack or burst. Blowouts will often create a sinkhole when the surrounding material is drawn into the tile and transported downstream.

Tile blowout/sinkhole development in agricultural landscapes can occur from a variety of means:

- collapse of clay or concrete tiles from degradation over time
- inadequate venting
- expansion of tile system without adequately resizing main or sub-mains
- outlet blockages
- improper joint connections or junctions between old/new tile lines
- contact of deep tillage equipment with shallow tile lines
- animal burrows

The identification of sinkhole development is most easily performed in the late stages of spring snowmelt or following subsequent spring rain events when tile flow is generally high and when

soils typically have reduced surface cover. Sinkholes range in size from a few inches to several feet and can be hard to find. Sinkholes can be observed during high flow periods by water upwelling or going into the ground and during lower flow periods by the hole left in the ground (Fig. 2). In some instances, a "sucking" noise can be heard as air and water are drawn into the sinkhole. Inspection of tile systems for sinkholes can be expedited by accurate maps identifying tile line locations and the use of GPS technology.



Figure 2: Sinkholes caused by tile blowout

Blowouts/sinkholes in tile systems should be repaired promptly by knowledgeable individuals. The direct pathways from the soil surface to the tile system created by these features can result in large amounts of sediment, debris, manure, fertilizer, or chemicals entering tiles. University of Wisconsin Discovery Farms ([uwdiscoveryfarms.org](http://uwdiscoveryfarms.org)) tile drainage research has observed elevated soil and nutrient loss to tile systems from sinkholes. Improper repairs and quick fixes can result in on-going problems with blowout/sinkhole development and tile system blockages.

Farmers are allowed to fix their own tile sinkholes, but there are several questions to consider:

1. **Is the tile system within a drainage district that is governed by county drainage boards?** If so, the local drainage board needs to be contacted prior to tile system maintenance. Cost-sharing for the tile system repair might be available through the drainage board. To determine if your tile system resides in a drainage district, visit the Wisconsin Department of Agriculture, Trade and Consumer Protection Drainage District Program at: [http://datcp.wi.gov/Environment/Drainage\\_Programs](http://datcp.wi.gov/Environment/Drainage_Programs) for a web map and additional information.
2. **Is the location of the sinkhole within a designated wetland?** Contact your local United States Department of Agriculture - Natural Resources Conservation Service (USDA-NRCS) field office for wetland determination. USDA benefits may be affected with non-compliance of rules: [http://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs142p2\\_020717.pdf](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_020717.pdf)
3. **What caused the sinkhole to develop?** The cause of sinkhole formation is critical to prevent future formation of other sinkholes. Tile age degradation, improper venting or

undersized tile mains are common issues that will result in persistent development of sinkholes. If tile system issues are not remedied in conjunction with the tile sinkhole, the problems will persist.

**Always contact Digger's Hotline -- (800) 242-8511 -- prior to excavation for tile repairs.**

#### References

- Cooley, E.T., Ruark, M.D., & Panuska, J.C. (2013). Tile drainage in Wisconsin: Managing Tile-Drained Landscapes to Prevent Nutrient Loss: GWQ064. <http://learningstore.uwex.edu/Assets/pdfs/GWQ064.pdf>.
- Panuska, J.C., Ruark, M.D., & Cooley, E.T. (2009). Tile drainage in Wisconsin: Maintaining tile drainage systems. University of Wisconsin-Extension publication: GWQ056. <http://learningstore.uwex.edu/Assets/pdfs/GWQ056.pdf>.
- Ruark, M.D., Panuska, J.C., Cooley, E.T., & Pagel, J. (2009). Tile drainage in Wisconsin: Understanding and locating tile drainage systems. University of Wisconsin Extension publication: GWQ054. <http://learningstore.uwex.edu/Assets/pdfs/GWQ054.pdf>.

---

<sup>1/</sup> Co-Director, UW Discovery Farms, P.O. Box 935, 4319 Expo Drive, Manitowoc, WI 54221-0935