TUESDAY, SEPTEMBER 22, 2020 2:15 PM – 3:15 PM

Tile Drains – Minimizing Manure Nutrient Transport

Eric Cooley, Discovery Farms Discovery Farms tile drainage research and major findings

William Matthews, Oregon Department of Agriculture Oregon's experiences with managing tile drains

Michael Schmidt, Iowa Environmental Council Review of programs/requirements in several of the Midwest states

Discovery Farms Tile Monitoring in Wisconsin and Minnesota

Eric Cooley UW Discovery Farms Tim Radatz MN Discovery Farms





Discovery Farms[®] is a **farmer led** water quality research and education program

- Farmer led in all aspects
- Credible, unbiased research
- Effective communication of results



















Combined WI and MN dataset provides greater information



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(2018-2019): 105 site years 53 sites 38 farms

Discovery Farms NRCS-CIG Tile Project in MN and WI (2018-2020)



Provide tools for farmers and advisors to diagnose and treat fields with high nutrient loss through tile drains

Determine if intensively monitored tile sites can be complemented by lower intensity monitoring

Understand the link between soil health and tile drainage













Three levels of monitoring

8 Intensive





20 Intermediate

20 Basic















Water transport from surface to tile in frozen soil conditions



Macropores can provide a main transport pathway to tile

Preferential flow paths can be well developed

- Earthworm burrows
- Root channels
- Shrinkage cracks
- Structural porosity



(Shipitalo et al., 2004)







MINNESOTA DEPARTMENT





Water can move rapidly from surface to tile in long-term notill



Soil test phosphorus levels in the top of the soil profile influence both surface and tile water dissolved phosphorus concentrations



Soil Test P (ppm); 0-1 inches













Manure application method and manure consistency impact the potential for manure transport to tile drains





< 2% solids – high potential

Pre-tillage or application methods to disrupt macropores













Soil conditions, manure application rate and weather also factors in manure transport to tile drains



- Dry soils may be as challenging as saturated soils
- Reduce rates or split applications
- Monitor weather forecast prior to applications
 - Runoff Risk Advisory Forecast



Runoff Risk Advisory Forecast

http://www.manureadvisorysystem.wi.gov/runoffrisk/index



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Tile blowouts provide direct conduit from surface to tile





to rupture



ruptured drain



during low-flow periods



Surface soil collapses to form blowout









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For more information:

http://www.uwdiscoveryfarms.org/on-farm-projects/tile

https://fyi.extension.wisc.edu/drainage/



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Guide for tile drainage regulation compliance in Wisconsin



Tile drain age systems are a common management tool in agricultural crop production. Tile drains are used to comol soll moisture and allevate wet soll conditions to create optimal moisture levels for plant cord growth and to improve timelines and accessible for field agretarities. They have the potential to improve conjustica and conditions in poorly drained areas. Tile drainage can be found throughout the state of Wisconsin, however, it is most commonly found in eastern and southered Wisconsi where consist and toopagehor prevent adecaute tainarea.

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Natural Resources Conservation Service (NRCS) is an agency of the United States Department of Agriculture (USDA) that provides technical and financial assistance to farmers and other private landowners.

If you are 4 USA fam program participant, with your local USA/FSA office and fill out a form Ao-1026 (high) exolible land conversion and welfand conflictuation form you to installing, and/fung or repairing life drainage systems. The form ask if anyone has or will be doing any installation, impovement, modification or maintenance of the donaloge expressions or other land modification activities on land that has not been evaluated by NRCS. Please contact your local FSA and/or NRCS office for further information.





