Conservation Drainage Priorities: Learning from Stakeholders

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Driven to Discover℠

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Project Objectives and Design

A critical time in drainage history

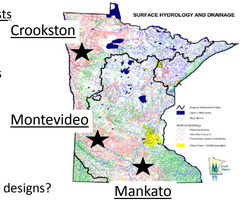
Agricultural drainage systems in Minnesota developed over the past 100 years. As these aging systems are updated or replaced, there is a window of opportunity to incorporate new designs and practices that improve the balance between water quality and agricultural productivity. To effectively take advantage of this opportunity, we wanted to learn from the people who are responsible for implementing drainage infrastructure.

Nine focus group discussions: three groups in three places

Private engineers and agency hydrologists
who design drainage systems

Contractors and farmers
who install and use drainage systems

Drainage authorities
counties and watershed districts
who implement drainage statute



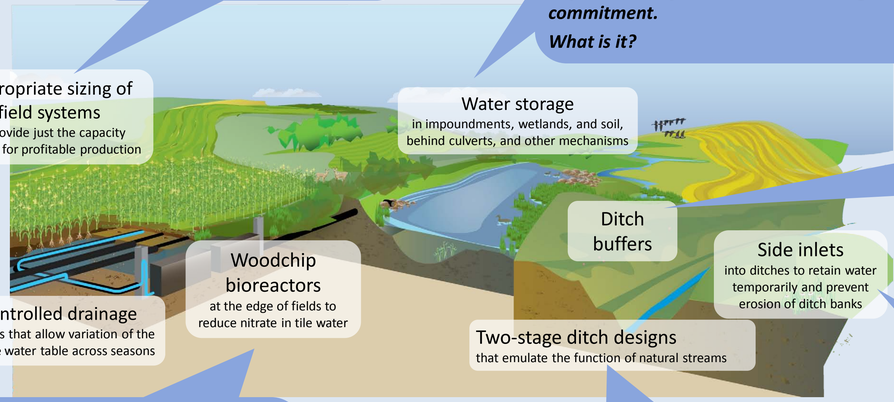
Discussion topics

- What are the promising practices and designs?
- Describe the barriers to their implementation.
- How does agricultural drainage impact water quality and flow?

Conclusion: People are eager for more discussion.

Conservation Drainage

. . .is a set of drainage practices and designs intended to support the needs of agricultural production while addressing impacts on water quality and flow. It is the **act of preventing or mitigating** the unwanted effects of artificial drainage.



What participants said. . .
We do this already.
Sizing of field drainage systems is about economics. Contractors and farmers felt they couldn't afford to over-size systems.

What participants said. . .
This is the win-win solution to ag drainage and water quality/flow concerns.
Looks like trouble: it's expensive and requires a lot of collaboration and long term commitment.
What is it?

What participants said. . .
Of course do this. Widely relevant. But be flexible in targeting and sizing.
A few people also mentioned the public relations value of buffers – the public can see the grasses and the wildlife.

What participants said. . .
Of course do this. Widely relevant.
One of the groups observed that some counties perceive inlets as improvements, while the law treats them as repairs.

What participants said. . .
Need to see that it is cost effective, practical, and provides a yield benefit.
Participants were generally apprehensive about the cost and management requirements, and were looking for more evidence of the nitrate and yield benefits. People were interested in the potential to store water.

Participants in all regions felt that the greatest potential was in the Red River Basin. In other regions, much of the land is either too steep, pocked with potholes, or already tiled. Some participants, especially in Crookston, were quite concerned about leaving the water table high over the winter and eliminating the soil storage that could reduce spring floods. The other concern with winter storage (in all regions) was the potential for frost to break tile lines.

What participants said. . .
Maybe this could be useful. Is it cost effective and practical? What is the lifespan? Will it be practical on large acreages?
Bioreactors were appealing to some people because they are a quick fix to treat nitrate and they can be attached to any existing tile system without taking land out of production.

What participants said. . .
Interesting. Can we afford to reshape ditches and take more land?
Many participants had little awareness of the design and goals of a two-stage ditch and were not familiar with research or demonstration results.

What participants said. . .
People are key.
Communication is critical.
Building positive relationships is essential.
These were the most emphatic messages from participants.

What participants said. . .
Impacts of agricultural drainage are complex
Drainage generally increases peak flow, except that flow from tile will be delayed compared to flow from surface drainage.

Drainage increases total volume of flow, but participants were less certain about this impact of drainage. Some raised complexities such as
- either rate or flow may be a greater concern at different scales,
- the impacts of drainage may be overwhelmed by and irrelevant during extreme events,
- antecedent conditions and season make a difference,
- good drainage may increase production and evapotranspiration and thus reduce flow.

Participants wanted to know whether the magnitude of impact of conservation drainage practices justifies the costs.

What participants said. . .
Responsibility and fairness are important
Several participants emphasized the importance of maintaining objectivity and applying rules fairly – between landowners, across counties, and between landowners and agencies.

What participants said. . .
Watershed scale planning is spotty
The impacts of drainage practices accumulate at the watershed scale – especially water storage practices such as ponds or culvert sizing. Yet, watershed-scale planning of drainage activities is difficult and spotty around the state. (Examples of watershed scale planning would be reviewing culvert sizing or water storage options across the whole watershed, or establishing a county or district-wide schedule for redetermination of benefits so landowners feel that ditches are being managed fairly and with appropriate priorities.)

What participants said. . .
Institutional barriers
Participants told many stories – both positive and negative – about the impacts of policies and institutions on landowners' actions. Some of the strongest negative comments related to wetlands. Specifically, many participants felt the three-to-five years required for the wetland mitigation process was a substantial barrier, and the wetland delineation process was not always fair.

Guidelines for Action

1. **Support long-term relationships** and the individuals who are skilled at building and maintaining productive relationships.
2. **Be part of the conversation about drainage:**
   - Make goals explicit (ag production, water quality, flood/flow mitigation, habitat)
   - Build shared understanding of the complexity of hydrology and drainage
   - Be precise in defining terms and be explicit about assumptions when discussing impacts of drainage
   - Communicate within and between stakeholder groups, including the non-farming public
3. **Clarify the roles and responsibilities o**f various state and local agencies
4. **Discuss who – landowner or society – is responsible** for costs of managing or mitigating upstream contributions to drainage systems.
5. **Examine options for water storage** on the landscape.
6. **Promote watershed-scale views for planning and managing drainage.**
7. **Continue research and demonstrations,** especially full-scale demonstrations and analyses of costs and benefits.
8. **Address regional differences.**