



Applying knowledge to improve water quality

National

Water Program

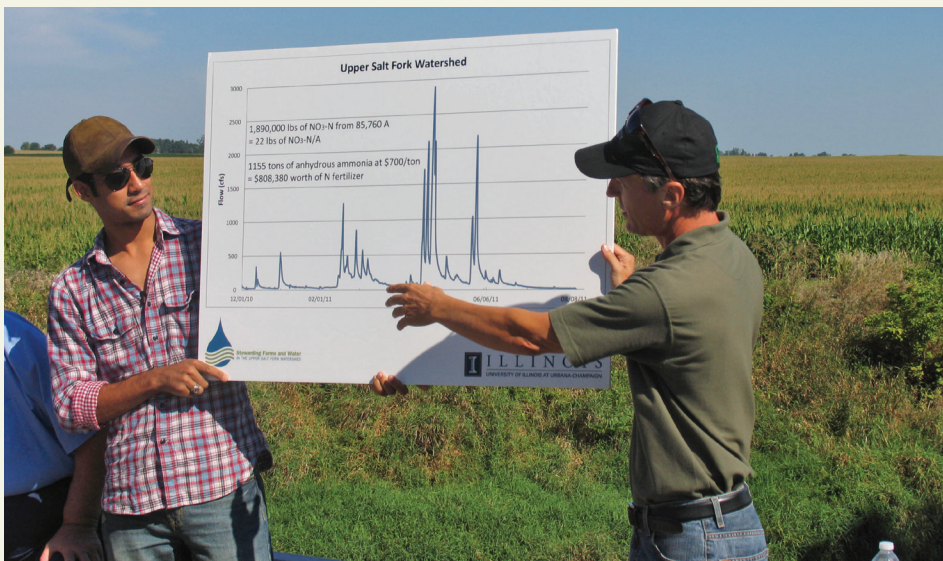
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2011 IMPACTS

INTEGRATED RESEARCH, EDUCATION, &
EXTENSION PROJECTS IN THE GREAT LAKES REGION

Tile Drainage Modifications to Reduce Nitrate Losses in an Agricultural Watershed:

Integration of Biophysical and Social Sciences with Extension and Education



Field day, August 2011

This project has been evaluating the placement and effectiveness of managed drainage and saturated lateral buffers in the heavily tile-drained upper Salt Fork watershed in east-central Illinois. Investigators have combined this work with assessing farm stakeholder perspectives via interviews and surveys to better understand their views on water quality and identify barriers to acceptance of these new conservation practices. The goal is to reduce nitrate losses through tile systems in the watershed, through outreach to landowners and farmers about how they can maintain crop productivity but also reduce their nitrate losses. Investigators have partnered with the local Soil and Water Conservation District, American Farmland Trust, and an active watershed group, to contact, survey,

educate and collaborate with landowners in the watershed. These partners were critical in finding collaborators, and 10 tile systems are currently being monitored for flow and nutrients, including two managed drainage systems (paired with free drainage controls).

Due to landscape and collaborator constraints, suitable sites for saturated lateral buffers in this watershed were not located. Investigators instead expanded their search to tile systems where they could evaluate fertilizer timing (fall versus spring) to reduce nitrate loss. The price of corn and soybeans, value of land, and importance of and views on tile drainage were found to be significant challenges in locating collaborators who would either be agreeable to managed drainage or even would allow tile monitoring.

A field day held in August 2011 was effective in explaining the possible field-level reductions in nitrate loss with managed drainage and in reducing nitrate export down the river. Taking stakeholders to the river gauging and tile monitoring sites and showing them the fertilizer lost in pounds and dollars, combined with demonstrations of techniques to reduce this loss, provided effective opportunities for dialogue and information transfer.

Results from interviews with 39 agricultural stakeholders and surveys from 83 farm operators suggested a number of barriers to adoption of new water quality conservation practices. First, many perceived water to be high quality and fewer than 25 percent of respondents felt nitrogen or phosphorus contributed to water quality problems. The overarching

Tile Drainage Modifications to Reduce Nitrate Losses in an Agricultural Watershed: Integration of Biophysical and Social Sciences with Extension and Education (continued)



Field day, August 2011

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concern with getting water off the land was seen as far more important than reducing nutrient runoff or addressing downstream problems. Second, cost (both direct and potential yield loss) was seen as the number one barrier to implementing water conservation practices. Perceived inflexibility of techniques to adapt to changing conditions was also noted. Third, trust in regulatory agencies such as the Illinois Environmental Protection Agency was considerably low, as was willingness to change practices if regulated to do so. Research findings suggest farmers value field demonstrations over web-based information as well as flexible, voluntary conservation options with financial incentives.



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