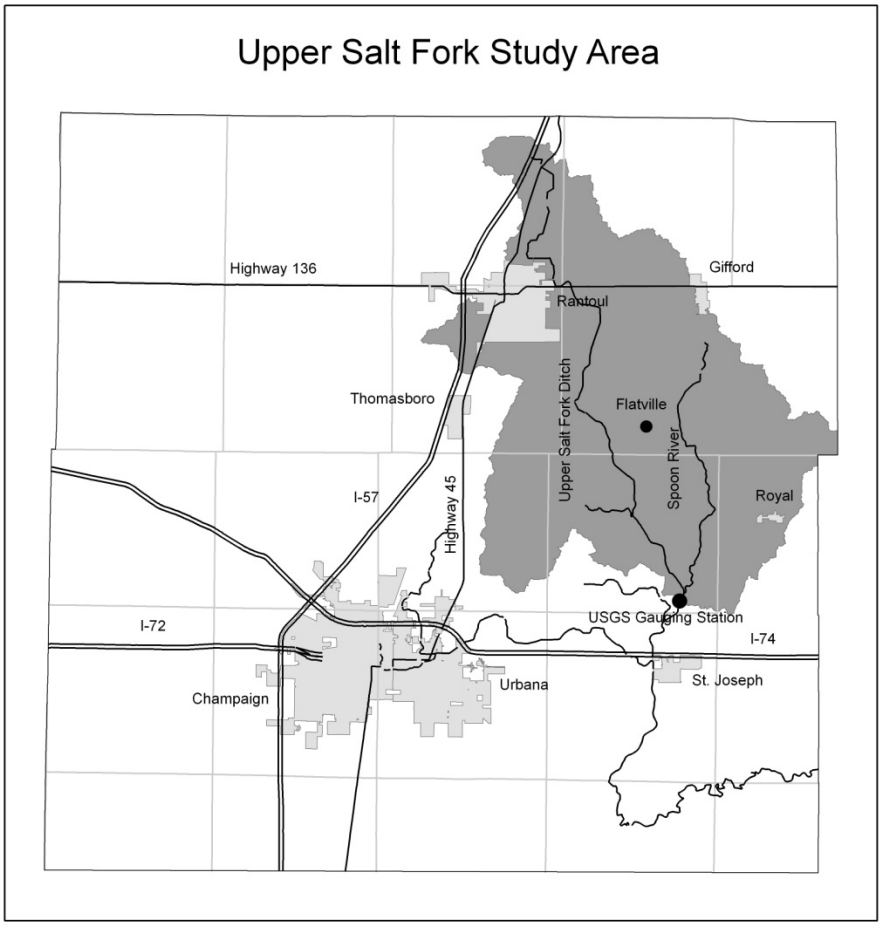
Upper Salt Fork Project
Survey Report and Status Update, 2011



ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

CHAMPAIGN COUNTY
SOIL AND WATER CONSERVATION DISTRICT

Flint Lab Upper Salt Fork Project Timeline

Fall 2009 to Winter 2009/10:

- Literature Review and lab meetings to discuss broad research questions
- Preliminary interviews with the Upper Salt Fork Implementation Team
- Interviews with drainage ditch commissioners, tile contractors, and fertilizer dealers. Audio recorded and transcribed.

Spring 2010:

- Designed survey from previous studies and our own research questions.
- Sent out postcards to all landowners in study area to determine interest in a short phone interview
    - Landowners included farmers, owners that rent land, farmer operations that rent land, landowners with no connection to farming, and landowners who have family members farming for them
- Phone interviews conducted, audio recorded and transcribed

Summer 2010:

- Administered survey

Fall 2010-Spring 2011:

- Analyzed data
- Presented findings to Champaign County Soil & Water Conservation District

Summer 2011:

- Fieldwork and research on tile management practices
- Demonstration of tile management practices for landowners

Next Steps:

- Comparative analysis with other farming and water quality studies
- Preparing for a restudy in late 2012 to examine changes in perspectives.

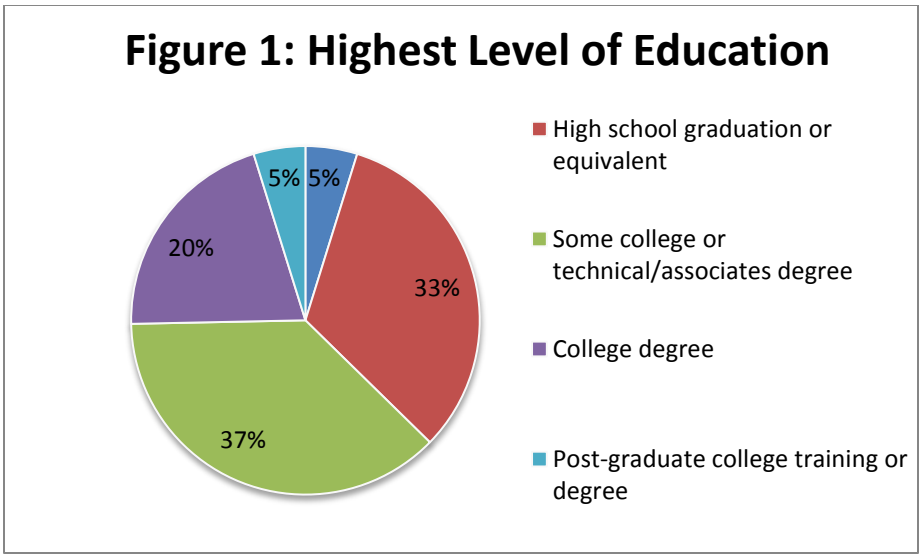
Survey Introduction:

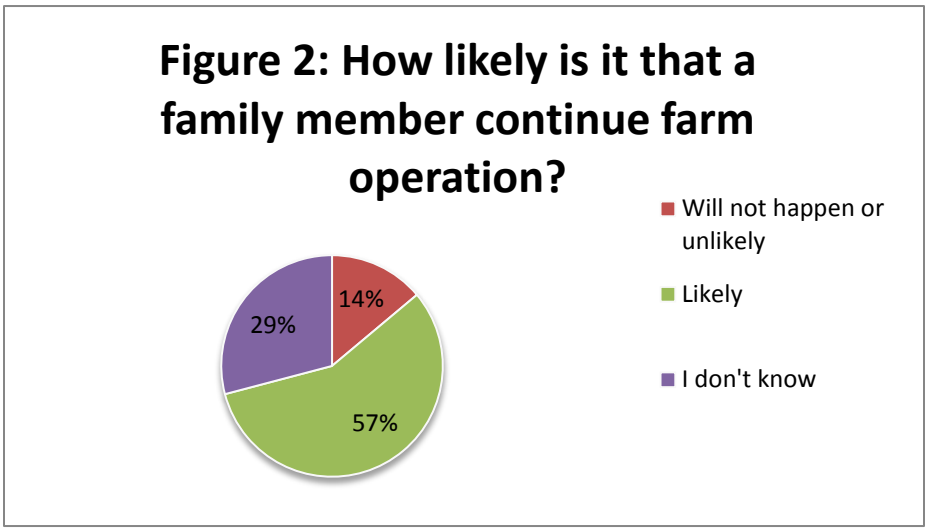
The Upper Salt Fork Ditch/Spoon River watershed is the focus of a 3-year study to evaluate tile drainage modifications for reducing nitrate loss from agricultural fields. This report outlines basic findings from a mail survey sent out to farm managers/operators in the summer of 2010 pertaining to water quality decision making and management. The mailing addresses were obtained from FSA and given to the Champaign County Soil and Water Conservation District. The names and addresses remained anonymous to University of Illinois researchers through an ID number assigned by the SWCD. FSA identified 306 farm operators and managers in our study area. Surveys were sent out at the end of June and included a $5.00 gift card to a local Farm and Fleet store. Two weeks later a thank you/reminder postcard was sent to all 306 addresses thanking those that would have completed a survey and reminding those who had not yet completed a survey. After another week, a second wave survey was sent to all of the non-respondents. It was later found out that due to boundary line issues some surveys were sent to participants that actually farm outside of the study area. With the help from SWCD we were able to determine that thirty-eight of the addresses should technically not have been included as they were outside the study area and they were deemed ineligible. Accounting for ineligible and undeliverable surveys, our final response rate was 31.2%. Completed surveys were received from eighty-three farm operators and farm mangers. The survey consisted of thirty-four closed-ended questions and two open-ended questions. The questions were separated into four categories: farm characteristics, water quality management, agricultural network, and personal characteristics.

Total	306
Received	83
Declined	9
Ineligible	38
Undeliverable	2
Response Rate	31.2%

Characteristics of Respondents:

The average age of survey respondents was 58 years old. The ages of respondents ranged from 25 years old to 88 years old. The respondents were predominately male (99%) and 58% of respondents stated that they lived within the study area. The educational level of respondents represented multiple levels with the greatest proportion having at least some college education (57%) (see Figure 1). The average number of years respondents were involved in farming was 37 years. When asked if the current farm operation was previously owned or operated by a family member, 92% stated yes. Survey respondents were also asked how likely it was that a family member will continue owning and/or operating the current farm operation in the future. The majority of survey respondents (57%) indicated it was likely that a family member will continue the farm operation (see Figure 2).

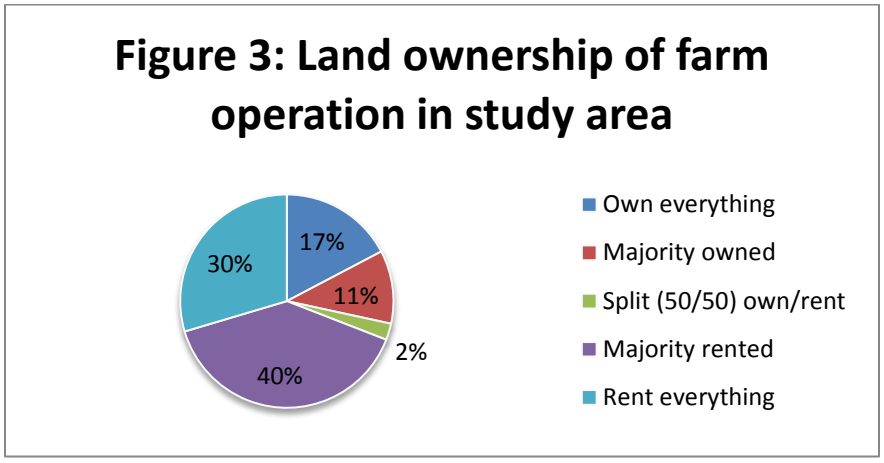




Farm Characteristics:

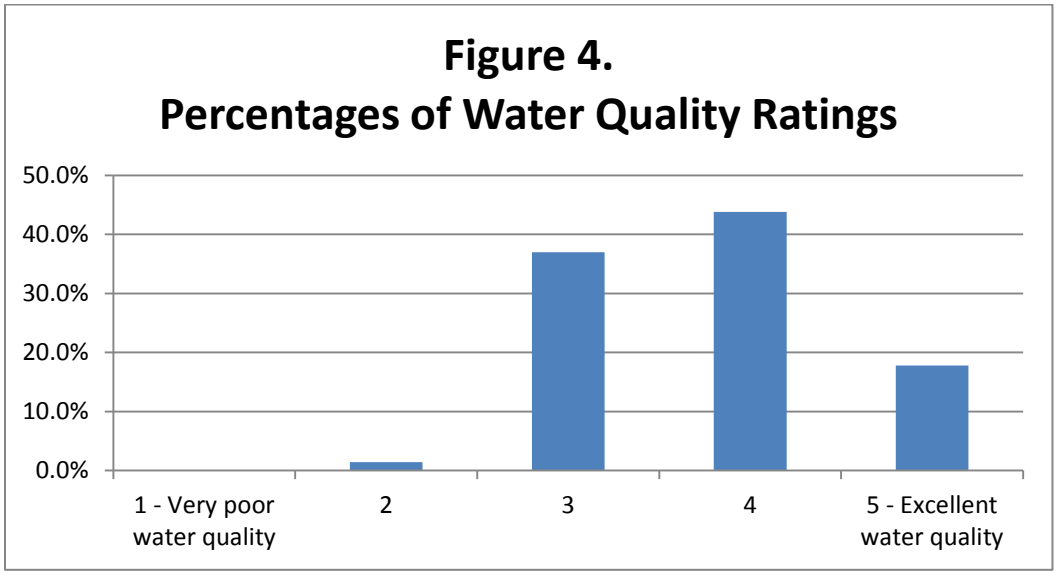
The average total acres farmed, both within and outside of the study area, was 1,047 acres. The range of total acres farmed was from 15 to 24,000 acres. The average acres farmed in the study area was 295 acres and the range of acres farmed in the study area was from 15 to 1,300 acres. Survey respondents were asked how many different fields or tracts they farm in the study area. The average number of fields or tracts was 3.5 and the range of different fields or tracts was 1 to 10 fields or tracts. All of the survey respondents farmed corn and/or soybeans in the study area. Survey respondents also stated they have acres designated to other types of farm production or purposes, including CRP, hay/alfalfa, and livestock. There was also a diverse range of land ownership among the survey respondents, with 70% farming on predominantly rented land (see Figure 3). Respondents were also asked if they would characterize any of the

land they farm in the study area as needing more tile drainage then they have currently and 86% stated yes.

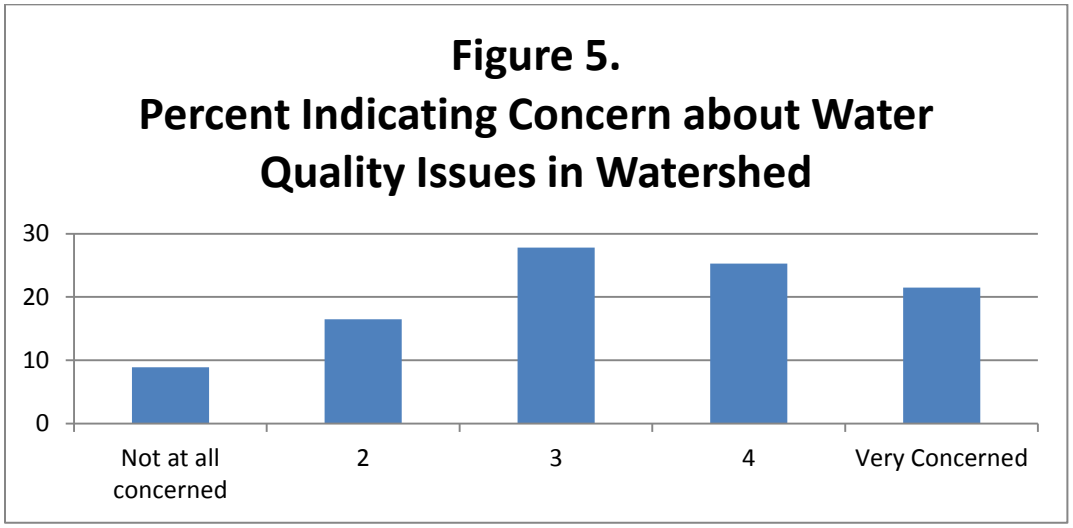


Water Quality Management:

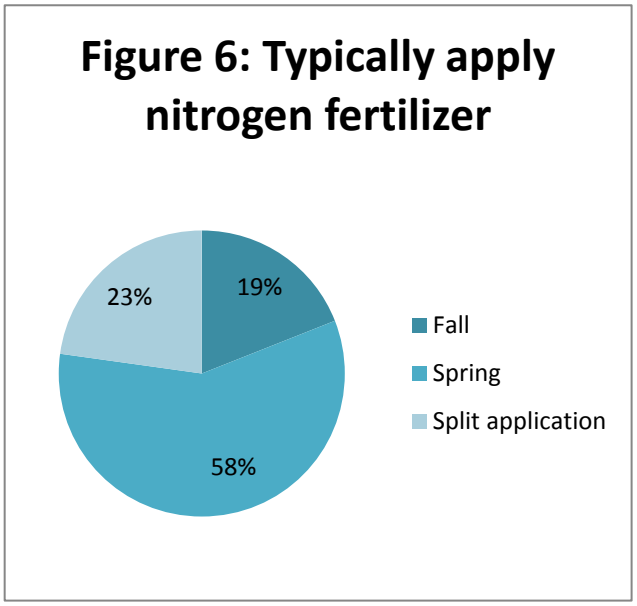
Survey respondents were asked how they would rate the water quality conditions in the Upper Salt Fork Ditch/Spoon River Watershed from 1 = very poor water quality to 5 = excellent water quality (see Figure 4). The majority of respondents (62%) stated the quality of the water was good (answered 4 or 5).



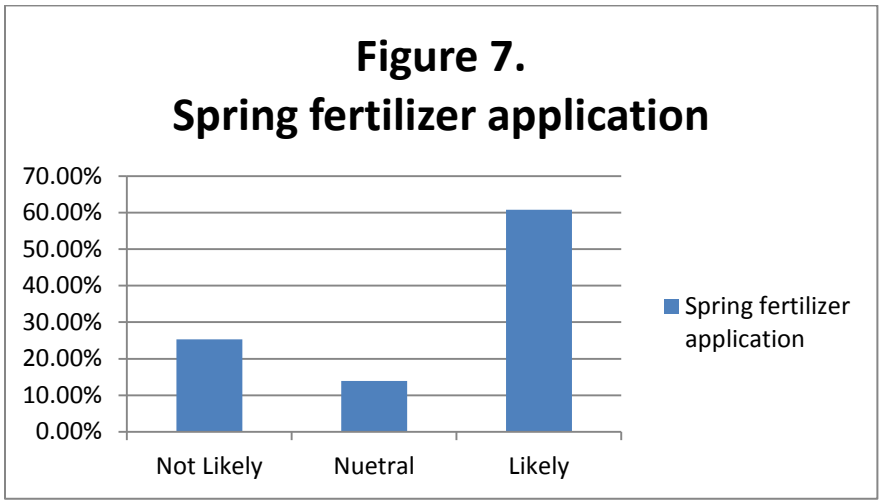
Respondents also rated their concern about water quality issues in the Upper Salt Fork Ditch/ Spoon River Watershed from 1 = not at all concerned to 5 = very concerned (see Figure 5). Fewer than half of the respondents (47%) stated they were concerned about the water quality in the study area (answered 4 or 5).



When asked if their level of concern had changed in the last ten years, 77% stated that it stayed the same while 22% said their level of concern increased and 1% of respondents said their level of concern decreased. Respondents also identified whether they typically apply nitrogen fertilizer in the fall, spring, or use of split application (see Figure 6). Results show that 19% applied nitrogen fertilizer in the fall, 58% applied in the spring, and 23% applied fertilizer as a split application. Due to the unusually wet weather in the fall of 2009, most nitrogen fertilizers were applied in the spring of 2010 which may indicate these results are not indicative of typical years.



Survey respondents were asked how likely they were to continue spring fertilizer application on a scale of 1 = not at all likely to 5 = very likely (see Figure 7). The majority of respondents (61%) stated they were likely to apply nitrogen fertilizer in the spring (answered 4 or 5).



When asked their opinion about the factors contributing to the water quality of the Upper Salt Ditch / Spoon River Watershed, respondents answered that sediments and municipal discharge were more problematic contributors to water quality issues than nitrogen and phosphorus. (See Table 1 based on 1-5 point scale where 1 = not a problem and 5 = severe problem).

Table 1

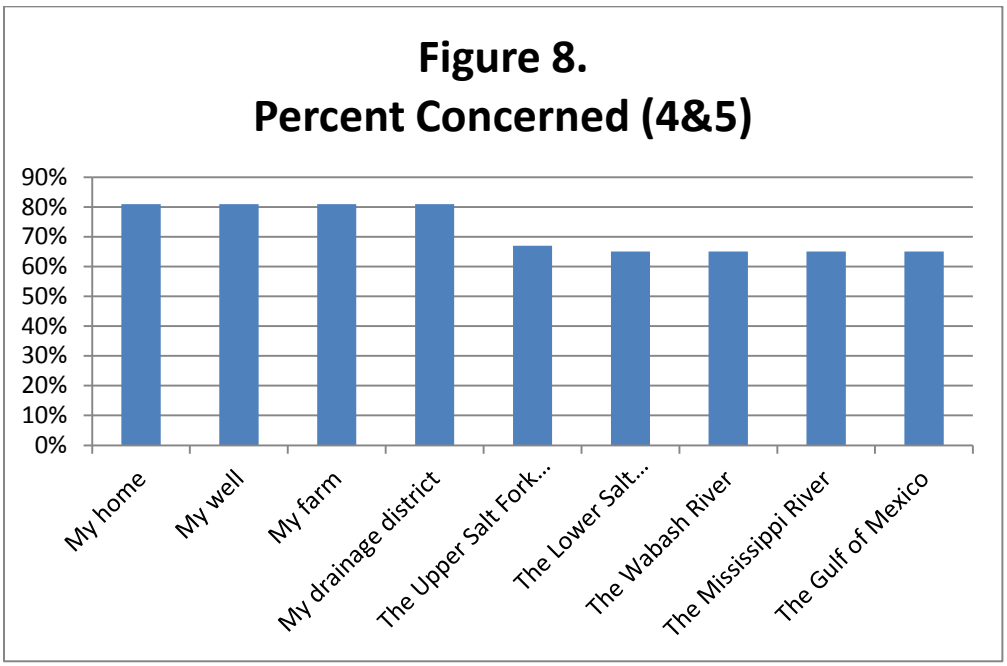
Possible Sources	Percent indicating problem (4-5)
Sediment	34.8
Municipal Discharge	28.6
Nitrogen	23.8
Phosphorus	18.3
Bacteria and Viruses	17.0
Runoff from Lawns	16.1
Pesticides	12.5
Manufacturing	12.0
Septic Systems	9.7
Livestock Manure	9.6
Salt	4.0

Farmers in the watershed were clearly already engaged in some conservation practices at the time of this survey. As Table 2 shows, conservation tillage was most common, followed by grassed waterways, nutrient management, filter strips and precision application technologies.

Table 2

Practice	Percent Currently Using Practice (# of farm operators)
Conservation/reduced tillage	87% (64)
Conservation tillage (no or strip till)	59% (45)
Grassed waterways	60% (46)
Nutrient management	58% (43)
Filter strips	47% (35)
Precision application technologies	45% (34)
Field terraces	19% (14)
Grade stabilization structures	16% (12)
Saturated lateral riparian buffer (tile parallel to ditch)	13% (10)
Annual cover crop	9% (7)
Installing/restoring wetlands	8% (6)
Water table management (Controlled drainage)	8% (6)
Injecting phosphorus	7% (5)
Installing ponds	4% (3)
Bioreactors to intercept tile drainage at edge of field	4% (3)

Survey respondents were also asked to rate their level of concern about the impacts of water quality at different geographic areas (see Figure 8). Concern for water quality from the home to the drainage district was higher on the whole than from the Upper Salt Fork watershed to the Gulf of Mexico.



Respondents were asked about the importance of specific issues when they make water quality management decisions on their farm (see Table 3). On a scale from 1 = not at all important to 5 = very important, the most important issues when making water quality management decisions were improving or maintaining the condition of their farm for future generations of farmers in their families, improving or maintaining the appearance and integrity of their farms, improving their farm production and bottom line, and improving or maintaining relationships with neighboring farmers. Please note that the order of these factors changes if percentage indicating importance is used instead of average score.

Table 3

Issues for Water Quality Management Decisions	Average Importance Score out of 5	Percent Indicating Important or Very Important (4-5)
Improving or maintaining the appearance and integrity of my farm	4.49	95.0%
Improving or maintaining the conditions of my farm for future generations of farmers in my family	4.64	93.8%
Improving or maintaining my relationships with neighboring farmers	4.40	92.5%
Improving my farm production and bottom line	4.45	83.8%
Improving the quality of water downstream	4.14	78.8%
Promoting conservation of natural resources	4.10	74.6%

Respondents were asked under what circumstances they would modify their farm operations to improve water quality (where 1 = Not at all willing to modify and 5 = Very willing to modify). Results are shown in Table 4. The survey shows that more farmers and land managers were more likely to modify their current practices if the practice shows evidence of increasing productivity and effectiveness, if there are financial incentives, and if other farmers or family are adopting the practice. They are less likely to modify their existing practices with federal or state regulations.

Table 4

Circumstances and Willingness to Modify Farm Operation to Improve Water Quality	Average Importance Score out of 5	Percent Indicating Willing or Very Willing (4-5)
If you learned of convincing evidence showing modifications would increase farm productivity	4.04	80.6
If you saw convincing evidence from local demonstration plots	3.78	67.1
If financial incentives were provided to cooperating farmers	3.72	61.5
If you learned of scientific evidence showing the effectiveness of water management innovations in reducing nutrient loss	3.67	58.7
If most neighboring or family farmers adopted water quality improvement management practices	3.51	53.8
If recommended by the county Soil and Water Conservation District	3.35	38.5
If recommended by the University of Illinois Extension	3.24	38.2
If recommended by my county Farm Bureau	3.14	31.6
If federal or state regulations were established governing water quality of agricultural runoff	2.78	23.1

Respondents also stated how much certain issues limit their ability to implement water quality conservation practices on their farm (see Table 5). The top limiting factors were personal out-of-pocket expense, lack of government funds for cost share, that no one else the respondent knows is implementing the practice, and possible interference with the flexibility to change land use practices as conditions warrant.

Table 5

How much does each of the following issues limit your ability to implement water quality conservation practices on your farm?	Average Importance Score out of 5 (from not at all to a lot)	Percent Indicating A Lot (4-5)
Personal out-of-pocket expense	3.89	67.6
Lack of government funds for cost share	3.76	60.6
Possible interference with my flexibility to change land use practices as conditions warrant	3.64	55.4
Concerns about reduced yields	3.61	56.6
Not having access to the equipment that I need	3.44	52.0
Environmental damage caused by the practice	3.30	46.5
Requirements or restrictions of government programs	3.32	44.6
Lack of available information about a practice	3.11	37.1
Not being able to see a demonstration of the practice before I decide	3.14	36.5
I do not own the property	2.90	33.8
Approval of my neighbors	2.88	29.2
No one else I know is implementing the practice	2.65	20.2
Don’t want to participate in government programs	2.47	19.0

Agricultural Network:

Respondents were asked how helpful they found different forms of agricultural information (see Table 6.). The most helpful methods for farmers to receive information were field demonstrations, farm magazines and newsletters, or workshops. Webinars and web-based information were found to be the least helpful.

Table 6

How helpful do you find the following forms of agricultural information?	Average Importance Score out of 5	Percent Indicating Helpful or Very Helpful (4-5)
Field demonstrations	3.90	71.5
Farm magazines and newsletters	3.64	57.2
Workshops	3.52	48.0
Video demonstrations	3.34	47.3
The Illinois Agronomy Handbook	3.15	41.3
Printed information sheets	3.25	39.5
Newspaper articles	3.17	38.1
Web-based information	2.69	25.7
Webinars (web-based seminars)	2.48	20.5

Farmers also indicated their level of trust in various entities related to agricultural production in the area (see Table 7). Those groups garnering the most trust include other farmers, tile contractors, family members, drainage commissioners and the Champaign Co Soil and Water Conservation District.

Table 7

Please rate your level of trust with the following entities (regarding information on water quality or water management)	Average Trust Score out of 5 (from no trust at all to a lot of trust)	Percent Indicating High Levels of Trust (4-5)
Other farmers	4.06	72.0
Tile contractors	3.94	71.4
My family members	3.90	70.6
Drainage commissioners	3.91	69.1
Champaign Co Soil and Water Conservation District	3.78	68.5
Champaign Co Farm Bureau	3.60	55.3
University of Illinois Extension	3.43	47.6
Illinois Dept of Natural Resources	3.23	44.2
Fertilizer Dealers	3.48	42.5
University of Illinois Researchers	3.27	41.4
Seed Dealers	3.21	35.8
Natural Resource Conservation Service	2.93	25.6
US Geological Survey	2.76	18.9
IL Environmental Protection Agency	2.35	17.5
Champaign-Urbana Sanitary District	2.47	15.8
Salt Fork River Partners	2.39	11.2
Grand Prairie Friends	2.22	8.4
Prairie Rivers Network	2.19	8.4

Conclusions

Tile drainage losses of nitrate from the Corn Belt are a major cause of Gulf of Mexico hypoxia and also lead to local water quality problems. Understanding what can be done to reduce these losses depends on a clear understanding of farm operator perspectives and experiences. The findings described above are an initial step toward that goal. As one farm operator indicated, a diverse approach is important along with recognition of farmer concerns about mandated changes which might affect production:

> "I would say, have a program that uses incentives instead of, you know… Have a carrot out there instead of a stick. I think it would be much more beneficial. I'm not sure what that program would be but, for instance, if they had a program to, you know, where you would sidedress your nitrogen in the spring instead of fall application, maybe there would be an incentive to do that, some type of program. The reason being is that it might be more efficient use of nitrogen, you know, less chance of the nitrogen ending up in the ground water…. I think you'd get mixed results whatever you do. That's one fear I have, is that we're going to be forced into these things – we're going to be forced to use less nitrogen, you know, no fall application, those type of things."

In our analysis, farm size and the nature of ownership or renting mechanism (cost-share or cash rent) had very little impact on the results.

We will continue to monitor farm operator perspectives and compare results to other studies in the Midwest. A re-survey effort of the Upper Salt Fork farmers will occur late in 2012.