

**Subcommittee on Water Resources and Environment
U.S. House of Representatives**

Hearing on Nonpoint Source Pollution: The Impacts of Agriculture on Water Quality

April 19, 2007

Testimony of

Roger Wolf, Director of Environmental Programs,

Iowa Soybean Association

4554 114th Street

Urbandale, Iowa 50322

Tel: 515-251-8640

E- mail: rwolf@iasoybeans.com

Mr. Chairman and Members of the Subcommittee:

Good afternoon, my name is Roger Wolf. I am honored to be here today representing the Iowa Soybean Association, as the Director of Environmental Programs. Thank you for asking me to provide my perspectives on agricultural non-point source pollution and water quality.

My testimony will cover the following:

1. Introduction to Iowa Soybean Association and our experience with performance-based environmental programs
2. Agricultural Nonpoint source pollution impacts upon water quality, progress, challenges and emerging opportunities
3. Recommendations for the future

The Iowa Soybean Association is the nation's largest state-based, row-crop commodity organization in the country, with over 6,100 dues paying members. Over the last decade, we have become a pioneer in employing agriculture information technology and leadership at multiple scales to help farmers improve agronomic, economic and environmental performance. Our mission is to expand profit opportunities while promoting environmentally-sensible production.

Seventy percent of Iowa's 31.7 million acres of farmland are planted in soybeans or corn. Iowa's farmers perennially rank among the top states in corn and soybean production, and often lead the nation in pork and egg production, thanks to the availability of plentiful and reasonably priced feed crops. In terms of cash receipts alone, Iowa farmers' average nearly \$11 billion, yes billion with a B, per year. And now, those same Iowa farmers are stepping-up to help meet the nation's call to be a key player in renewable energy and the bio-economy. These are exciting times to be involved in agriculture.

Yet, societal expectations of production agriculture are increasing. Growing concerns about nonpoint source pollution, particularly losses of nutrients from farm fields and associated impacts on the environment, are prompting an increase in studies, articles and debate about what

can be, and should be, done to bring about environmental improvements. It is clear that society wants improved environmental quality, along with affordable food and energy.

The factors contributing to Iowa's productivity and high acreages in these crops include the naturally-rich soil and a hydrologically-modified landscape that is relatively flat to gently rolling. It is these same factors that might also be contributing to high nitrate levels in many of Iowa's streams and rivers.

Iowa, like many other Midwest states, has hundreds of waterbodies that do not currently meet current water quality standards. An example is Iowa's North Raccoon River, which drains some of the states richest farmland, but has the distinction of being among the nation's nitrate-yielding. The Raccoon serves as a source of drinking water to Des Moines, Iowa's largest city, and many surrounding communities. The nitrate levels in the river require the Des Moines Water Works to operate expensive nitrate removal facilities. So water quality concerns virtually the entire population of central Iowa.

But Iowa is not alone. Numerous studies and reports describe the increase in nitrogen deposits to the Mississippi River system originating from the nutrient-rich, productive soils and wet spring climates of the north-central farm belt states. There is some variance in the tracking of nitrogen levels by watershed. Depending on models used to generate this data, generally the highest nitrogen contributions to the water are attributed to north-central and northwestern Iowa and central Illinois, with some isolated watersheds in Minnesota and others in Indiana and Ohio.

These reports list contributing non-point sources such as cropping patterns (corn-soybean rotation), naturally organic-rich soils that are augmented by nitrogen applied in commercial fertilizers and manure, animal waste from livestock operations and wildlife, increasing runoff from urban development, and leaching from failing septic systems.

So there are many possible nitrate contributors.

However, please allow me to be clear, agriculture is not in denial about these issues. Farmers do value environmentally sound management on their farms. Most farmers believe they are already using many of the Best Management Practices (BMP's) advocated by various agencies and institutions. The fact of the matter is that Iowa farmers are using all available state and federal conservation financial assistance to help install practices and if more funding was available it would be used. In fact, there is a backlog of EQIP project requests in Iowa. Farmers want to work on these issues because they want to do the right thing, and they know that good environmental stewardship translates into economic benefits over the long haul.

To give you the real picture let me review USDA working land conservation program implementation in Iowa.

Contracts on Iowa's working land increased from 461 in 2002 to 3,531 in 2005. These figures illustrate that there is increasing interest in these programs. But those contracts still represent a small percentage of the over 60,000 Iowa farmers on working lands.

And while funding for the program is significantly higher than in previous years, USDA data shows that only a small percentage of farmers actually gain access to programs and ultimately participate.

For example, the FY 2006 Environmental Quality Incentives Program (EQIP) in Iowa funded slightly over 1,500 contracts. However the NRCS has a backlog of 1,500 applications from farmers who want to apply practices but will not be funded. A similar illustration exists with state soil and water conservation cost share programs – farmer demand to do work is high, but funding is not keeping pace.

Still, agriculture has made significant progress in recent years in protecting soil and water resources. For example, modeled estimates on soil conservation practice application from 1982-2003, illustrate that soil erosion in the U.S. has been reduced by 43 percent, according to the USDA's National Resources Inventory (NRI). There are also many other signs of significant conservation progress:

- Iowa farmers used conservation tillage on almost 5.1 million acres of corn in 2004, up from 4.9 million acres in 2002, according to the Conservation Technology Information Center (CTIC).
- Iowa farmers have more than 1.9 million acres enrolled in the CRP, the sixth largest state enrollment in the country (August 2006, Farm Service Agency)
- Iowa farmers have more than 460,000 acres enrolled in the continuous CRP signup, more than any other state, or 13 percent of the total acres enrolled nationwide (August 2006, Farm Service Agency)
- Iowa farmers have enrolled more than 126,000 acres in the Wetland Reserve Program since 1992 (Iowa NRCS)
- In 2002, nearly 2,500 landowners installed soil and water conservation practices protecting more than 27,000 acres with terraces, waterways, structures, basins and other measures.

Yet despite this ongoing work and the progress being made, impairments identified as originating from non-point sources — possibly due in part from agriculture — continues to be difficult to control and address in Iowa's waters. It's becoming apparent that limitations may exist in the environmental efficacy and the economic viability of various land management technologies. Therefore, the ability of agriculture to meet water quality goals through use of BMP's alone may be limited.

In 2006 the Center for Agriculture and Rural Development (CARD) located at Iowa State University conducted an analysis titled, "Conservation Practices in Iowa: Historical Investments, Water Quality and Gaps." The work was done through support from the Iowa Corn Growers Association, the Iowa Farm Bureau Federation, the Iowa Soybean Association, and the Leopold Center for Sustainable Agriculture.

The analysis is preliminary, but CARD scientists estimate that the statewide cumulative annual cost has been about \$435 million for the installation of seven major conservation practices. The practices considered by the assessment and for which data were readily available included

activities such as \$37 million for terraces and grass waterways. Five other practices added up to \$397 million.

CARD then used that data and watershed water quality modeling to estimate that, as a result of these practices and investments, total nitrogen reductions in the 13 watersheds that represent the majority of Iowa range from 11 to 38 percent. Nitrate reductions range from 6 to 28 percent. Total phosphorus reductions were 25-58 percent.

But again, significant challenges still remain. The study also estimated that the total gross cost of implementing an “optimal mix” of conservation practices to achieve a 40 percent reduction in phosphorous, would be almost \$613 million a year. Implementing the phosphorous target would also simultaneously result in a state-wide reduction in nitrate loadings of over 31 percent.

However, these reductions, while significant, may fall short of meeting new Water Quality Standards for nutrient criteria. Granted, this analysis is a computer-generated modeling exercise. But it does illustrate the magnitude of the work remaining, and the potential investment required, alongside the challenges of meeting future Water Quality Standards, assuming we continue use prescriptive BMP's.

Some of the other findings from the study that are instructive include:

- Cost-effective measures are different across different watersheds, and watershed residents should gain a good knowledge of their watersheds before adopting any control policies that have been promising elsewhere.
- Targeting different pollutants will mean different land use options, so it is important watersheds identify their needs before any policy discussions occur.
- Programs must target Nitrogen and Phosphorus reductions to be the most effective.
- This work creates a reasonable baseline to evaluate the value of the work already completed by Iowans, and the optimal combinations to address future needs.
- These standards need to be accompanied by significant resources and given adequate time for implementation; and,
- Significant investment in monitoring and evaluation would enable us to be more strategic with our program implementation.

Farmers tell of feeling accused of being stubborn or unyielding, yet the truth is that they are constantly refining their management as technologies evolve. And as technologies and knowledge evolve, BMPs also evolve. Redefining them is a constant journey that has no end. At one time the horse drawn plow was a BMP. Before that, corn was planted with fish being used as a fertilizer source. Farmers have always acted on the best information available to make decisions, and there's every indication that they always will.

So the questions at hand are:

- What more can agriculture do to meet additional rising expectations for addressing water quality challenges?
- How can Congress help?

In 2000 the Iowa Soybean Association initiated environmental programs that sought to advance environmental quality and production efficiency. Today, our programs model cooperative public and private partnerships and apply leadership to achieve goals. The scope of these programs involve over 500 individual farmers, over 1,500 fields, and includes participants in all 99 counties, and compliment eight subwatershed efforts within four major river basins.

Financial support is leveraged with soybean checkoff resources, private grants and donations and funds from the state and federal government. Our programs work to synchronize with local, state and federal assistance programs, like the Iowa Integrated Farm and Livestock Management Program, the USDA – NRCS Environmental Quality Incentives Program, Conservation Innovation Grant Program, and the Conservation Security Program; US EPA's Regional Geographic Initiative; such private sector agriculture partners as John Deere, Pioneer Hi-Bred International - a Dupont Company, and Agriculture's Clean Water Alliance, as well as with private conservation organizations such as Environmental Defense, The Nature Conservancy and The Sand County Foundation.

Multiple tactics are used, but all center on providing growers with technical assistance enabling them to collect and process data from their own farms so that they can address resource concerns in the most effective way for their own operations. We call this Applied Evaluation. Applied evaluation is done on several levels, including individual fields, multiple fields under a grower (farm scale) and within subwatersheds. For example, techniques used at the field level to evaluate nitrogen efficiency in corn production include guided corn stalk sampling, aerial remote sensing, and the use of replicated strip trials, with Global Positioning Systems (GPS) and yield monitors.

Management changes, based on on-farm applied evaluation, translate into economic sustainability, as yields improve with optimum (usually fewer) inputs, sometimes including reduced tillage. No farmer wants to spend an extra \$10–15 per acre on nitrogen that will be lost from the soil and washed down the river. Many of the Iowa farmers using applied evaluation have found they can effectively reduce the amount of nitrogen they apply to corn fields by 50–80 lbs. per acre and maintain economic yields. Others have found they need to continue their current rates of nitrogen, but that by changing the time and form of application, they can reduce the loss of nitrogen to the soil and water and make it available to the plant, thus improving their yields.

The effectiveness of applied evaluation is not just in collecting the data annually, but in analyzing it in the context of the operation and the watershed and in helping the farmer develop a management system that will incorporate the annual evaluation results into improved decisions.

So, practices are adjusted for the coming year and new evaluations designed – in other words, an adaptive management system for the farm is now set in motion. As farmers experience the value of the adaptive management cycle, centered on applied evaluation, they are offered options to expand the scope and scale of their adaptive management system into a Certified Environmental Management System for Agriculture (CEMSA), addressing many additional resource issues and environmental issues and aspects for the whole farm.

For example, a whole farm energy audit, with energy efficiency planning and an alternative energy assessment are being added this year. Farmers engaged in these evaluation and adaptive management programs experience accelerated benefits by aggregating their evaluation data with groups of producers in their watershed and learning from the anonymously displayed, aggregated data. The watershed benefits as a critical mass of producers within the watershed work to evaluate document and improve their nitrogen and other resource management.

The early results of our work clearly show that most farmers have potential for improving management in their operation. The reason? With better technology and information the farmer can do better than a generalized BMP recommendation.

These farmer directed programs are getting real world, real time, meaningful answers that are often better for farm economics and the environment than the existing BMP's, and now through active demonstration many of the participating farmers are quickly and eagerly adopting these new answers and are looking for more.

The common, underlying theme is that farmers are taking control of their issues with the power of applied evaluation, information and adaptive management. It is a performance-based approach. And because this approach works, it gets quantifiable results, and it is replicable, we already see it evolving into a working model for landscapes across Iowa and beyond. When we started using the approach of applied evaluation and adaptive management we began to improve economic and agronomic performance on Iowa farms, interestingly we also saw that what had been successful in one place was not successful in another. Although the challenges that exist across all landscapes in Iowa can be similar, it became obvious that there are simply too many variables for broad prescriptions to be effective management tools.

Our recommendations for the future involve system changes that include policy and programs that help advance toward:

1. Maturation of performance-based approaches at all levels
2. Site-specific initiatives using locally collected data to guide implementation strategies (at field, farm, and watershed scales)
3. Employment of integrated solutions (various methods of site-specific source reduction based on local data), coordinated and targeted within watersheds
4. Adaptive management systems at individual and group levels to provide ongoing data collection for performance outcomes measurement and optimization
5. Documentation of practices and outcomes
6. Means for incorporating outcome data as feedback for adjusting implementation strategies and tactics
7. Intergovernmental cooperation and public-private partnerships tailored to local and regional needs
8. Improved means for technical transfer to speed the spread of new developments in tools, information, and solutions that can be adapted for farmers and watershed organizations across the region, so that resources aren't wasted replicating invention and to ensure that capabilities improve over time
9. Coordination and reformation of funding sources

- a. Financial assistance must be made available to groups of farmers (e.g., in watersheds), as well as individual farmers.
- b. Financial assistance must be provided for management evaluation and data collection in order to move from practice-based to performance-based strategies.
- c. Financial assistance for farmers must recognize the likely need for initial major investments required to change cropping, tillage, or drainage systems and share in those costs (e.g., loss of investment in current equipment and purchase of new).
- d. Funding (public and private) must be increased substantially for Technical Assistance to farmers and groups, such as watershed organizations.
- e. Funding for improved performance in the water must recognize and be geared to the long-term commitment required (5-10 year funding commitments, rather than 1-3 year) to determine performing strategies for specific watersheds, then implement strategies and tactics and collect feedback data to optimize management and document results.

What can Congress do? As I reviewed the various jurisdictional programs under this subcommittee it is clear that there are many agencies that have responsibility for protecting and improving the waters of the nation. Finding a way to focus these programs, to become more complimentary and resource centric would be a key recommendation.

From an agricultural non-point source perspective, the issues are complex and diffuse. What will work in one location will be quite different from what will work in another. The theme of 'Cooperative Conservation' comes to mind.

In any case, we're sure that targeting and flexibility are going to be required.

One area that could be targeted is the Upper Mississippi River watershed, and the sub-watersheds within, focusing on making progress on nutrients would be a leap forward. We believe progress in achieving water quality goals for agricultural watersheds in the Upper Mississippi River Basin hinges on changes that amount to a paradigm shift at individual farm and watershed levels:

- Site-specific, *applied evaluation* must become a centerpiece in programming, and
- *Adaptive management systems* that integrate feedback data from regular applied evaluation must be adopted;
- The efforts of individuals must be *aggregated and coordinated*, at least within Watersheds;
- A means for *diffusing and institutionalizing innovation* (not generalized recommendations, but performing systems) must be developed and supported.

To accomplish this, we recommend:

1. First, the establishment of an **Upper Mississippi River Basin Initiative** to provide a framework for intergovernmental, multi-jurisdictional, and public-private collaboration in implementing and funding a strategic, performance-based, resource-centric Plan for Environmental Performance throughout the basin;
2. Second, the integration into Upper Mississippi River Basin **farm program funding for additional Financial and Technical Assistance** to assist farmers and organized watersheds with implementing performance based management

Deploying the collective leadership of federal, state, local and the private sector is the most likely way forward for achieving progress on non-point source pollution and meeting water quality goals. We hope that Congress, too, adapts its management of the issue of conservation at the farm level. We think that there are many opportunities for supporting these ideas in the 2007 Farm Bill. Please consider our work as a touchstone and our people as a resource as you move forward with changes under your jurisdiction and as work proceeds on the 2007 Farm Bill.

I'm Roger Wolf with the Iowa Soybean Association. The farmers I represent and I thank you for your time.