Farmer-led Efforts to Improve Water Quality

Sean McMahon, Executive Director
Iowa Agriculture Water Alliance
Myth vs. Fact

- **Myth:** Farmers’ actions determine water quality.
- **Fact:** Other factors – outside of farmers’ control – play a larger role in water quality, such as climate, precipitation and soil fertility.

Farmers can and are making improvements on the aspects they do control.
Myth vs. Fact

- **Myth**: Farmers are the only ones responsible for water quality.
- **Fact**: The water quality challenge in agriculture is substantial. In addition, there are other sources that have to be managed, such as industry, urban and natural areas.
Overview

- Introduction to Iowa Agriculture Water Alliance
- Water quality challenge is significant
- We didn’t get here overnight – won’t solve it overnight
- Global picture for water quality and food demand
  - Nutrients are important for growing food
- Iowa’s importance to food production
- Proven on-farm practices improve water quality
- More needs to be done
Introduction to Iowa Agriculture Water Alliance

Mission
- To increase the pace and scale of farmer-led efforts to improve water quality.

Founding Organizations
- Iowa Corn Growers Association
- Iowa Pork Producers Association
- Iowa Soybean Association

Diverse Advisory Council
- Conservation NGOs
- Scientists
- Farmer leaders
Global Demand for Food is Changing the Way Land is Used
Global Demand for Food is Changing the Way Land is Used
Global Demand for Food is Changing the Way Land is Used
Sustainable Intensification of Agriculture

The agricultural challenge: Feeding humanity while protecting nature.
Market Demand also Impacts Nutrient Use – Global Nitrogen, Phosphorus and Irrigation Use
Dead Zones of the World

Major known eutrophic and hypoxic areas. Reprinted from Selman et al.
U.S. Corn Production and Nutrient Use

Source: Computed by TFI from data reported by NASS, USDA.

95% increase in efficiency!

Corn Production
Nutrient content of water has more to do with historic changes in land use and hydrology than inputs by farmers.

- Current major cropping system leaves soil vulnerable to erosion and nutrient leaching.
- Markets and Technological Advances have shifted cropping patterns and increased productivity.
- Have the most tools available to date and will still continue to develop and adopt new technologies.
Changes in Land Use

Corn, Hay, Small Grains, & Soybeans Harvested Trends
1866–2008

[Graph showing trends in acres harvested for various crops from 1866 to 2008.]
Corn Nitrogen Cycling & Budget

Native Soil Organic Matter Nitrogen ~ 10,000 lb N/acre

Microbial production of nitrate from native soil (100–400 lbs N/acre/year)

Microbial re-uptake of nitrate (150–350 lbs N/acre/year)

Corn Grain Harvest (~100 lbs N/acre/year)

Corn Nitrate Use (~165 lb N/acre)

Corn Residue Return (~65 lbs N/acre/year)

Fertilizer to Corn (~150 lbs N/acre/year)

Gaseous Loss (~10 lbs N/acre/year)

Nitrate leaching to water (~30 lbs N/acre/year)
Iowa Farmers’ Contributions in Perspective

Total Grain Production (Metric Tons)
Iowa – 55 Million
Canada – 45 Million
Iowa Farmers’ Contributions in Perspective

Total Soybean Production (Metric Tons)

China – 15 Million
Iowa – 14 Million
Nutrient Delivery to Gulf of Mexico

State shares of the total annual nutrient flux

Nitrogen

Phosphorus

Percent Share

- < 1
- 1 to 5
- 5 to 10
- 10 to 17

Nutrient Reduction Strategy

Leads
• Iowa Department of Ag and Land Stewardship
• Iowa Department of Natural Resources
• Iowa State University

• Released May 2013, after public comment period
• Living document to be adjusted as technologies are developed and understanding of these systems/practices improves.
• Focus is on PROVEN field practices that improve water quality
• Goal of 45% reduction in total N and P
Water Quality Initiative Projects
WQI Demonstration Watershed Projects

- Importance:
  - Demonstration of practices that work
  - Partnerships with wide range of community stakeholders
    - leverage resources and
    - expand audience
  - Strong outreach/education components
  - Regional reach to share knowledge with farmers, landowners, farm managers, peer networks, etc.
Examples of Practices that Work


Re-saturated Riparian Buffer

Prairie Strips

= corn and bean row crops

= reconstructed prairie
Summary

• Water quality challenge is substantial
• **We didn’t get here overnight – won’t solve it overnight**
• Flexible, innovative methods are working
• Global demand for food requires a responsible, collaborative approach
• Iowa’s contributions to food production largely due to rich, organic soils that also pose a water quality challenge
Acknowledgements

- Cliff Snyder, International Plant Nutrition Institute
- Harry Vroomen, The Fertilizer Institute
- Matt Lechtenberg, Shawn Richmond, Iowa Department of Agriculture and Land Stewardship
- Todd Sutphin, Roger Wolf, Iowa Soybean Association
- Mike Castellano, Matt Helmers, Iowa State University
Questions?