A Presentation of the 2011 IA-MN-SD Drainage Research Forum

November 22, 2011
Okoboji, Iowa
Iowa Soybean Association
Environmental Program

TODD SUTPHIN
STATE WATERSHED COORDINATOR
IOWA SOYBEAN ASSOCIATION

515-334-1052
tsutphin@iasoybeans.com

2011 DRAINAGE RESEARCH FORUM
NOVEMBER 22, 2011
ARROWHEAD RESORT – OKOBOJI, IOWA
Environmental Programs and Services

- Provide leadership from agriculture; have impact.
  - Environment
  - Policy
  - Profitability
- Seeking and capturing performance; tools/techniques help farmers address issues.
- Apply science to gain understanding, impact and profit
- Crosses multiple geographic scales
- Valuing cooperative partnerships and collaborations
- Provide value to membership and Iowa farmers.
Watershed Program

Elements:

- Multi-scale watershed assessment and planning facilitation
- CEMSA planning with groups of farmers
- Management Evaluation – Groups / Replicated Strips Trials/Stalk sampling
- Environmental evaluation via water monitoring
- Targeted Conservation Systems – Bioreactor, Shallow Wetland, others
- Technical Service Contracts – ACWA / DMWW / TNC / ISU / Prairie River and Prairie Winds RC&D’s
Watershed Planning

- A comprehensive plan for the watershed
  - Farmer involvement; locally-led
  - Inventories available data
  - Identifies water quality concerns
  - Outlines resources and partners available
  - Provides guidance on steps needed to address the concerns

- Set of integrated solutions; no silver bullet

- Infield/Edge of Field

- MRBI practice list

- Implementation
Watershed Planning

- Watershed plans – 6 complete
- Implement & measure practices
- Stakeholder engagement
- More monitoring and measuring
Lyons Creek Watershed Management Plan

Top resource concern – Water Quality

- Nitrate
- Sediment
- Bacteria
Additional $7.4 million in financial incentives to help farmers implement new practices.
Agriculture’s Clean Water Alliance

Mission: To reduce the nutrient loss – specifically nitrate – from farm fields and to keep the nutrients from entering the Raccoon River and Des Moines River and its tributaries.

- 13 fertilizer dealers in the Raccoon/Des Moines River watersheds.
- Sell and apply most of the nitrogen used on 5 million acres of cropland in the watershed.
- Leading private sector sponsor of water quality monitoring
- Code of Practice
- Bioreactor demonstration study
Water Monitoring

- Certified Sampling - QAQC
  - Nitrate and Bacteria
- Real-time Remote Monitoring
- Investigative Monitoring
  - Ammonia
  - Cyanobacteria
- Effectiveness and Special Project Monitoring
  - Bioreactors
  - Event-triggered monitoring
  - Paired micro-watershed studies
Management Evaluation

- Loss of N from Farm Fields
- Cost Farmers Money

An opportunity to improve.
N Management
Stalk Test

- Stalk nitrate samples collected after physiological maturity to assess the N status of the crop.
- As the corn plant takes up N, it first accumulates in the ear to achieve maximum yield, then in the lower portion of the stalk.
- The Stalk Nitrate Test determines excess N availability, even at levels where yield is not limited.
Boone River - Results of Nitrogen Evaluation

- Low
- Marginal
- Optimal
- Excess
2006 Corn Stalk Nitrate Analysis (Boone River): Comparison Between Growers
Rapid Assessment of Stream Conditions Along Length (RASCAL)

• Assess in-stream & near-stream conditions; use GPS technology to provide continuous stream condition data for watershed.

• Results are intended to assist watershed groups identify priority areas for targeted conservation practices / BMPs.

• Land use assessment – help target upland BMPs.

- Adjacent Land Use
- Riparian Zone Cover/Riparian Zone Width
- Bank Stability
- Canopy cover
- In-Stream Habitat
- Pool/Riffle Frequency
- Substrate
- Point of Interest
- % Bare Bank
### Survey Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Categories</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Adjacent Land Cover</td>
<td>Row Crop</td>
<td>38.3%</td>
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<tr>
<td></td>
<td>Trees</td>
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<td></td>
<td>Grass</td>
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<td>Pasture</td>
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<td>Residential</td>
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<td>Riparian Zone Width</td>
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<td>10 - 30 ft</td>
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<td>30 - 60 ft</td>
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<td>&gt; 60 ft</td>
<td>28.6%</td>
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<tr>
<td>Bank Stability</td>
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<tr>
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<td>Mod. Stable</td>
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<td>Mod. Unstable</td>
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<td>Unstable</td>
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<td>Silt/Mud</td>
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<td></td>
<td>Average</td>
<td>58.7%</td>
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<tr>
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<td>Excellent</td>
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Lyons Creek Paired Watershed Study

- 600 – 1,100 acres
- Two treatment; one control
- Partnering with TNC, IDNR, IGSB, others
Lyons Creek Paired Watershed Study

Potential Practices for Treatment Watershed

- Cover Crops
- Intensive Nutrient Management (timing, rate, form)
- Edge of Field Buffers - Tile line Bioreactors, Riparian Buffers, Constructed Wetlands
- Drainage Water Management
- Tillage changes – Strip till, No-Till
- Alternative Surface water intakes
Bioreactor Demo and Evaluation

- End of tile nitrate treatment process
- Under anaerobic conditions nitrate-N is reduced by soil microbes using the wood chips as a carbon source
- Typical costs of installations range from $6,000 - $10,000
- Bioreactor size has been between 0.06 – 0.08% of acres treated
- Observed a 38% load reduction during the 2009 growing season in Greene County
Greene County – Tile Bioreactor
- FSA requires re-seeding

- Re-growth is usually shorter

Re-seed the area
Lessons Learned

- Local commitment and participation/Locally-led
- Planning is essential
- Infrastructure to gain capacity
- Everyone has a voice; who is your constituency
- Partnerships!
  - Synchronization of public and private; Local to Federal. Program delivery.
  - Benefits: time, resources, and expertise
- Resource management
- Program Delivery (both in-field and edge of field)
- Adaptive Management or Plan-Do-Check-Act
- No “silver bullet”
- TIME
Thank You

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For more information please contact:

**Todd Sutphin**
State Watershed Coordinator
Iowa Soybean Association
Environmental Program
515 251-8640 office
515 334-1052 desk
tsutphin@iasoybeans.com