Drainage Districts as Nitrate-Nitrogen Sources to Headwater Streams

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Iowa Soybean Association
Iowa Soybean Association
Environmental Programs and Services

Advance agricultural leadership for environmental quality by developing, applying, and promoting programs that assist producers to perform agronomically and economically.

- Develops policies and programs that help farmers expand profit opportunities while promoting environmentally sensitive production using the soybean checkoff and other resources.
- The Association is governed by an elected volunteer board of 21 farmers.
- Approximately 45,000 Iowa Farmers plant about 10 million acres of soybeans annually producing over 500 million bushels.
- Iowa’s soybean crop accounted for about $3.36 billion in US trade exports in 2010 – setting a record.
- Soy industry in Iowa - 16,656 jobs amounting to $632 million in labor income (2008 study)
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.
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
47 Priority Areas for Biodiversity Conservation
Monitoring
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
survey parameter categories

Adjacent Land Cover
- Row Crop: 38.3%
- Trees: 14.5%
- Grass: 5.1%
- Pasture: 35.0%
- Residential: 9.1%

Riparian Zone Width
- < 10 ft: 36.4%
- 10 - 30 ft: 11.7%
- 30 – 60 ft: 24.4%
- > 60 ft: 28.6%

Bank Stability
- Stable: 6.3%
- Mod. Stable: 34.2%
- Mod. Unstable: 26.8%
- Unstable: 32.7%

Substrate
- Boulder: 0.6%
- Cobble: 15.0%
- Gravel: 20.9%
- Sand: 55.4%
- Silt/Mud: 8.5%

Stream Habitat
- Poor: 28.6%
- Average: 58.7%
- Excellent: 12.7%
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
Lyons Creek Paired Watershed Study

- 600 – 2,000 acres
- Two treatment; one control
- Partnering with TNC, IDNR, IGSB, others
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
Relation of Nitrate Concentrations to Downstream Water Bodies
Where should nitrate reductions be focused?

Linear relations are anchored to y-axis by drainage district tile concentrations.
Variation in Relation by Season

![Graph showing nitrate concentrations in relation to log drainage area by season.](image)
Thank You

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