

# Nutrient Reduction Strategy Initiative to Reduce Nutrient Loading and Water Pollution

Bob Broz

University of Missouri Extension

[brozr@missouri.edu](mailto:brozr@missouri.edu)

573-882-0085

# What is the purpose on the nutrient reduction committee ?

- Reduce nutrient loading into the Mississippi River and into the Gulf of Mexico
- Protect and restore watersheds and aquatic ecosystems, critical natural habitats and develop and implement a state-wide N and P pollution reduction strategy
- Support goals and actions of the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force

Why focus on the Mississippi River Basin – part of 37 states- 3<sup>rd</sup> largest river drainage area in the world – hypoxia area average about 6,800 square miles



# Sources of Nutrients that cause hypoxia

- Estimated that 90% of nutrient load is derived from nonpoint sources
- Non-point source pollution
  - Cannot be traced back to any one source. Such as: fertilizers, nutrients from fields, lawns and golf courses, atmospheric deposition of N, erosion of soil containing nutrients, on-site sewage systems, etc.
- Point source pollution
  - Easy to trace to the source such as: discharge from factories and sewage plants

# Seven Areas to Consider

- Committee members are being asked to be a part of the development by signing up to be an editor, contributor or reviewer for the following areas:
  - Cropland
  - Pastureland
  - Animal Agriculture
  - Onsite and Decentralized Wastewater
  - Municipal and Industrial Wastewater
  - Urban Nonpoint Source/Stormwater/MS4
  - Other sources and Strategies

# Outputs of project

Develop a Nutrient Reduction Strategy for the state

Develop a comprehensive list of recommendations to reduce nutrient loads within critical watersheds of the state

Develop performance measures to track and measure progress

List prioritized watersheds based on their potential or present loading of N and P

Select three or four 12 digit HUC scale watersheds for demonstration projects to test implementation strategies.

Implement a state Nutrient Reduction Strategy

# What can we do to reduce nutrient runoff

- Know the basics
  - Soil test
  - Test nutrient value of manure
  - Understand how P and N travel in the environment
- Surface application vs injection to reduce runoff
- Understand weather patterns
- Work with new technologies
- Others?

# Nutrient loading divided into “P” issues and “N” issues

- Two primary pathways for phosphorus to enter the environment:
  - Soluble P carried in surface and drainage waters
  - Particulate P losses associated with erosion
- BMPs to reduce P loss from cropland tend to focus on 3 areas:
  - Optimizing timing of P application
  - Optimizing soil phosphorus levels
  - Decreasing soil erosion



- Nitrogen loss can be in many forms.
  - More mobile in soil profile and readily cycles within the air, land and water
  - Inorganic forms are predominantly water soluble
  - N will be utilized or with leach downward into the soil profile
  - Highly water soluble and carried away in surface runoff
  - Denitrification or surface volatilization

# Approved USDA/ Mo SWCD Nutrient Reduction Practices

- NRCS 590 - Nutrient management
  - Tillage system
  - Manure injection
  - Variable rate application/precision ag
  - Livestock Exclusion
- NRCS 554 – Drainage Water Management
  - terraces
- NRCS 393 – Filter Strip
  - Buffer strips
- NRCS 391 – Riparian Forest Buffer
- NRCS 386 – Field Border
- NRCS 328 – Conservation Crop Rotation
  - Cover crops
- N590 – Nutrient Management
- N554 - Drainage Water Management
- N393 - Filter Strips
- N391 - Riparian Forest Buffers
- N386 - Field Borders
- N430 - Irrigation Water Conveyance
- N442 - Irrigation System, Sprinkler
- N443 - Irrigation System, Surface and Subsurface
- N447 - Irrigation System, Tailwater Recovery
- N587 - Structure for Water Control

**Common Sense**

# It isn't just the practice!

- 4 Rs
  - Right source – type of fertilizer
  - Right rate – getting the right amount in the right application
  - Right timing – putting it on at the right time and when weather and field conditions are correct
  - Right placement – getting it in the right place to be most effective

# Nitrogen Strategies

- Optimize use efficiency through the 4 Rs
- Utilizing or binding left over soluble nitrogen from soil and groundwater reserves (cover crops as one means)
- Modifying the soil hydrology to prevent leaching (drainage water management)
- Trapping and treating surface runoff/or tile outlets (edge of field practices)

# Nutrient Reduction Strategies

- Must be approached and designed as an adaptive process used by farmers to manage nutrients.
- Selection of practices must be based on the specific characteristics of individual farms and fields and address efficiency and productivity.
- Profitability over productivity should be recognized and understood.

# Just knowing the practice doesn't make it happen

- Education is needed
- Cost-share potential
- Economic benefit to land owner
- Common sense

# To be successful:

- Encourage voluntary, incentive based practical actions
- Use existing programs where possible
- Follow adaptive management
- Identify existing and additional funds needed and funding sources
- Identify opportunities for innovative market-based solutions
- Be realistic in recommendations
  - XXXX

# EPA ask Missouri to:

- Prioritize watersheds on a statewide basis for N and P loading reductions
- Set watershed load reduction goals based upon best available information
  - Effectiveness of point source permits
  - Agricultural areas
  - Septic systems
  - others
- Provide accountability and verification measures



# Why should the Producer Care?

- Economics
  - If nutrients are leaving the field that is money lost by the farmer.
- Environment
  - Protecting the land and water for generations to come
- Being a good steward of your finances and of the environment.

# Questions?

- Where do we go from here?
  - What are the implementation strategies?
  - Is there an educational component tied into the strategies?
  - Others?
- 
- Bob Broz
  - [brozr@missouri.edu](mailto:brozr@missouri.edu)
  - 573-882-0085