

# Agroecosystems, Food Security, and Bioproducts

Breakout Group #7

# Comments

- Keep in mind that farms have many plans already and are overwhelmed with record keeping.
- Recognize environmental issues related to agriculture are becoming more pressing and will need to be addressed.
- Providing farm-level data on fertilizer use will not be popular.

# Current Report Recommendations

- Soil management
- Improve efficiencies
- Track sources and flows of Nr
  - Fertilizer use
  - N utilization efficiency
  - Wet/dry deposition of Nr
- Metrics of effects needed
  - Mitigation costs
  - Human health

# Comments on Recommendations

- How do we define an integrated approach to monitoring? Monitoring must relate to what you want to affect.
- Foundational data needs to be geospacially and **temporally** defined for fertilizer and **organic** nutrients.
- Specific intervention points to decrease Nr losses must be proposed to reinforce N cascade concept.
- Need more data on Nr losses on farms
- Need nutrient balance on all farms including crop farms (treating manure and synthetic Nr equally)
  - Currently not possible to access farm-level data to use in research programs or target extension priorities
- Understand there will always be losses but need better cycling to minimize losses.

# Programs to Manage Runoff

- We need to determine what is most effective to achieve desired goals
  - Watershed or Regional Level (farm distribution)
  - Farm scale
  - Consensus: Must do both starting with farm scale now
- Make utilities buy energy generated from farms; strive to have digesters contribute to managing Nr (e.g. capture  $\text{NH}_3$ , using energy to treat Nr in manure).
- Similar intervention strategy with air and water
- Farm-Level Nutrient Cycling Research with Farmers Participating
  - e.g. Iowa Soybean Association (Iowa Farm Network)
  - Facilitated by extension
  - Need data on cost effectiveness to promote to other regions and commodities

# Research Needs

- Can we best achieve goal from farm-level approaches or do we need regional changes?
- Nitrogen efficiency research must also have strong focus on soil management to decrease  $N_2O$  from soil
- On-farm production-scale research on impacts of management
  - e.g. Need research with measurements related to flows of N on farm, not just emissions from farm.
- Collected on-farm nutrient balance data must inform policy and extension program
  - e.g. Use farm-level data (nutrient balance) or regional data (fertilizer use) to target extension program.
  - Iowa On-farm Network (voluntary program does this)
- What is the most effective way to increase efficiency of farm

# Integration

- Approach must integrate airshed and watershed in programs to mitigate Nr concerns.