Smart Nitrogen Application Program:
4R Nutrient Stewardship to Reduce N_2O Emissions for Monetization of Carbon Offsets

C-AGG Meeting, July 20, 2011 – Chicago, IL
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Project Team

- The Fertilizer Institute
- Camco
- Climate Check
- The Climate Trust
- International Plant Nutrition Institute
- USDA NLAE
- Michigan State University
- Colorado State University
- National Corn Growers Association

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Overview

- Utilize nitrogen BMPs to reduce N_2O emissions
  - 4Rs – the right source at the right rate, the right time and in the right place
- Project focus on IA/IL corn – soybean rotations
- Develop a program to recruit & enroll producers
- Provide method to monitor & track fertilizer BMPs
- Use collected data to run & evaluate multiple protocols
- Use a selected protocol to quantify credits for aggregation and monetization

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4R Nutrient Stewardship

- Simultaneously improve productivity & efficiency
- Match nutrient supply with crop requirements and to minimize nutrient losses from fields
- BMPs affecting fertilizer Source, Rate, Time, & Place are site specific
  - Practices chosen for a given field are dependent on soil, climate, and management conditions, crop selection, and other site specific factors

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Task 1 – Develop SNAP & Nitrogen Desktop

- SNAP – website populated with info on:
  - Nitrogen BMPs
  - Climate change issues
  - Carbon markets
  - Water quality issues
  - Fact sheets
  - Videos
- Nitrogen Desktop – web enabled tool for:
  - Monitoring
  - Reporting
  - Verification
- Grower outreach and education:
  - Marketing literature
  - Winter association meetings
  - Expos
  - Targeted grower meetings

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Task 2 – Protocol Evaluation, Road Testing, and Comparison

- Meta-analysis of 4R practices & N_2O reductions
- Modify protocols as needed with meta-analysis
- Utilize producer data to road test protocols
- Evaluate based on scalability, verifiability, effectiveness, ease of use, credit quantification
- Protocols involved:
  - Alberta NERP
  - American Carbon Registry
  - Verified Carbon Registry

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Task 3 – Program Implementation

- Enroll 100 producers in IA & IL
  - Utilize SNAP in 2012 & 2013
  - Minimum of 500 acres per farm
  - Estimate 0.5 $mTCO_2e$ per acre
- Work with growers and their agronomists to implement practices
  - Utilize EQIP funds for nutrient management practices
- Collect & process data through Nitrogen Desktop for carbon offset quantification and monetization

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Task 4 – Program Evaluation

- Evaluate program for:
  - Producer acceptance
    - —assess N management decision process
    - —potential expansion to broader US)
  - Program effectiveness
    - —project implementation
    - —environmental outcomes
    - —social outcomes
    - —financial benefits

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Task	Task and SubTask Description	2011		2012				2013				2014	
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
1	Design and Build the Smart Nitrogen Application Program (SNAP)												
1.1	Programatic Design	1											
1.2	Stakeholder Outreach & Communications	2	8										
1.3	Evaluate Incentives for Practice Change						7						
2	Evaluation, Road Testing and Comparison												
2.1	Protocol Evaluation & NERP Training	1		3	4			3					
2.2	Protocol Road Testing (VCS, ACR, NERP)										5		
2.3	Protocol Results and Analysis											7	
3	Program Implementation, Project Aggregation and Market Transactions												
3.1	Program Implementation			5				5					
3.2	Project Aggregation						5				5		
3.3	Project Registration							5					
3.4	Project Verification and Credit Issuance								5				
3.5	Market Transactions and Revenue Sharing											5	
4	Evaluation of SNAP covering producer												
4.1	Producer Acceptance Evaluation											6	
4.2	Program Effectiveness Evaluation											7	
	Narratives for Payment Requests	8	8	8	8	8	8	8	8	8	8	8	8
	Semi-Annual Reporting		9		9		9		9		9		9
	Final Report												10

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Scientific Principles

- Source – ensure a balanced supply of essential nutrients, considering both naturally available sources and the characteristics of specific products, in plant available forms

- Rate – assess and make decisions based on soil nutrient supply and plant demand

- Time – assess and make decisions based on the dynamics of crop uptake, soil supply, nutrient loss risks and field operation logistics

- Place – address root-soil dynamics and nutrient movement, and manage spatial variability within the field to meet site-specific crop needs and limit potential losses from the field

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