

Improving Nitrogen Use Efficiency in Crop and Livestock Production Systems: Existing Technical, Economic, and Social Impediments and Future Opportunities

***August 13-15, 2013
Kansas City, MO***

Conference Sponsors: Woods Hole Research Center (WHRC), International Plant Nutrition Institute (IPNI), The Fertilizer Institute (TFI).

Conference Co-Sponsors: Soil Science Society of America (SSSA), American Geophysical Union (AGU), International Nitrogen Initiative (INI).

Website: <https://www.soils.org/meetings/specialized/nitrogen-use-efficiency>

Co-Conveners: Eric Davidson (Woods Hole Research Center), Chuck Rice (Kansas State University).

Organizing committee: Emma Suddick (Woods Hole Research Center), Mark David (University of Illinois), Dan Jaynes (USDA-ARS), Cliff Snyder (International Plant Nutrition Institute), Dave Mengel (Kansas State University), Carrie Laboski (University of Wisconsin, Madison), Linda Prokopy (Purdue), Al Rotz (USDA-ARS), Jerry Hatfield (USDA-ARS), Harold Van Es (Cornell), Ron Gehl (North Carolina State University), Cassie Mescher (SSSA), Keith Schlesinger (SSSA).

Conference Objectives:

Decades of research have yielded a wealth of knowledge to effectively manage nitrogen and other nutrients in agriculture. Small scale studies have demonstrated that inadvertent N losses to the environment can be minimized without jeopardizing profitable crop yields. Improvements in crop and livestock breeding, fertilizer products, feed management, and several other technologies are continuing to offer additional tools. Despite this progress, N losses to the atmosphere as N₂O, NO, and NH₃ and N losses to surface water and groundwater as NO₃⁻ and DON continue at levels that pose serious environmental and human health concerns in many regions of the world. The conference will bring together agronomists, biogeochemists, farmers, economists, sociologists, extension agents, educators, and policy experts from both public and private sectors to identify the major impediments to improved nutrient management and to make recommendations for overcoming those impediments. The objectives of the conference are:

1. Review the current suite of tools and knowledge used to optimize nitrogen management for crop and livestock production and promising new technologies under development.
2. Review case studies of successes and failures of policies and projects designed to encourage improved nutrient management.
3. Identify the major socio-economic and educational impediments to more widespread adoption of improved nutrient management practices.
4. Recommend existing opportunities for actions and policies to improve nutrient management using current knowledge and technology

5. Identify and prioritize goals for additional agronomic or socio-economic research needed to overcome impediments to better nutrient management practices.

Tuesday, August 13:

Plenary Session I: 8:00 – 12:00: Charge to the Conference

8:00: Welcome and opening remarks from organizers

8:10: **Keynote:** The challenge to optimize food production while minimizing environmental impacts – **Kenneth Cassman, University of Nebraska**

8:50: Technical progress and impediments to improving NUE through fertilizer and crop management – **David Mengel, Kansas State University**

9:30: Technical progress and impediments to improving NUE through manure management – **J. Mark Powell, United States Department of Agriculture-Agriculture Research Service, WI**

10:10: Coffee break.

10:40: Progress on private and public economic incentives for improving NUE on the farm and impediments to their adoption - **Otto C. Doering, III, Purdue University**

11:20: Social perceptions and awareness of linkages among food production, food prices and choices, and air and water pollution – **Linda Prokopy, Purdue University**

Lunch: 12:00 – 1:30

1:30-3:30: Plenary Session II: Roundtable Discussion by Agronomic Practitioners

Panel Moderator: Ron Gehl (North Carolina State University)

Seven individuals who are experienced “boots on the ground” practitioners of various types of nutrient management in crop and livestock systems will be invited to speak 10 minutes each about their personal experiences and their reactions to the morning’s presentations. This will be followed by 45 minutes of discussion among the panel members and the audience, moderated by one of our organizing committee members.

Invited panelists: Carrie Laboski (University of Wisconsin, Madison), Douglas Busdeker (Northern Farm Centers, Anderson Inc.), Joshua McGrath (University of Maryland), Chris Mann (White Oaks Farm), Todd Schaumberg (Polenske Agronomic Consulting) Gabriele Onorato (International Farming Corporation).

Poster session with beer and coffee: 3:30 – 6.00

6:00: Adjourn.

Wednesday, August 14

8:00 – 12:00: Plenary Session III: Case Studies of Efforts to Improve NUE:

Session Chair: Cliff Snyder (International Plant Nutrition Institute)

8:00 Introduction by session chair

8:05: **Keynote:** EPA Partners, Policy, and Programs for Addressing Nutrient Pollution: Lessons from Case Studies - **Denise Keehner, Director Office of Water, EPA**

8:40: Nutrient use efficiency in the Central Platte Valley nitrogen and irrigation demonstration project – **Richard B. Ferguson, University of Nebraska-Lincoln**

9:15: Farmer BMP Adoption: Lessons from the NIFA CEAP Watershed Studies – **Deanna Osmond, North Carolina State University**

9:50: Coffee Break

10:15: Does the policy-making process affect farmer compliance? a three-state case study of nutrient management regulations in the Chesapeake bay watershed – **Michelle Perez, World Resources Institute**

10: 50: Nitrogen management, regulation and impacts in northwestern Europe under the Nitrates Directive – **Hans van Grinsven, PBL Netherlands Environmental Assessment Agency**

11:25: Progress and impediments to improved nitrogen use efficiency in the Yaqui Valley of Mexico – **Ivan Ortiz-Monasterio, Mexico Global Wheat Program**

12:00 – 1:30: Lunch

1:30 – 5:15: World Café Rounds:

Hosts: Penelope Whitney (Resource Media) and Emma Suddick (Woods Hole Research Center)

1:30: Reassemble in plenary for instructions for World Cafe

Four questions will be presented in eight rooms (i.e., the same set of questions will be presented in each of two rooms), and the participants will be assigned to eight groups that will rotate among the rooms (e.g., groups of 25 rotating among 4 rooms for the first 100 participants, and 4 more groups of 25 rotating among 4 other rooms for the second 100 participants). Group assignments will be random, but stratified by “stakeholder” group category identified at time of registration (e.g., agronomy scientists, biogeochemists, economists, sociologists, farmers, NGOs, agency representatives, fertilizer industry reps). Each group will stay in a room for 45 minutes to discuss the question posted in that room and to record thoughts on flip charts. A discussion leader/recorder will be assigned to each room and will remain in that room. Pages of flip charts will be posted on the wall, so that each group will see the written comments of previous groups that have already addressed the same question. The questions must be developed by the program committee, but might include the following straw person possibilities:

1. If you were in charge of directing federal agency research dollars (including the full range of basic and applied research) how would you prioritize them among the topics that you've heard about yesterday and today?
2. To the extent that farmers are not currently using several of the technical tools currently at their disposal for improving NUE, what are the most important reasons to explain this?
3. What are the most promising opportunities for using existing technologies, policy instruments, and outreach efforts to improve NUE?
4. How would you explain to your brother-in-law or sister-in-law or the aid to your Congressional representative why they should care about devoting human and financial resources to improving NUE in agriculture?

1:45: Round 1

2:25: Round 2

3:05: Round 3

3:50: Round 4

Poster session with beer and coffee: 4:30 – 6.00

6.00: Adjourn

World Café discussion leaders have working dinner to prepare report for next day.

Thursday, August 15

8:00 – 12:00: Plenary Session IV: Looking Forward

8:00: Welcome and final day announcements, including proceedings or special issue publications

Conference wrap-up and reflections:

8:15: Report of World Café discussion leaders report and discussion

9:15: Karen Flournoy, EPA 7 Water Division Director

10:00 Coffee Break

10:30: Paul Fixen, IPNI

11:00: Jerry Hatfield, USDA-ARS

11:30: Chuck Rice, Kansas State University

12:00: Adjourn