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C-FAR

THE NATIONAL COALITION FOR  
FOOD & AGRICULTURAL RESEARCH

**Program:**

Putting Energy In to Get Energy Out

*“Energy Issues Affecting Corn/Soybean Systems:  
Challenges for Sustainable Production”*

January 23, 2012

# **PROGRAM**

## *Welcome and Introduction*

DR. JOHN BONNER  
NATIONAL C-FAR REPRESENTATIVE

## *Distinguished Speaker*

DR. DOUG KARLEN  
SOIL, WATER, AND AIR RESOURCES RESEARCH LEADER  
USDA-ARS  
NATIONAL LABORATORY FOR  
AGRICULTURE AND THE ENVIRONMENT  
AMES, IOWA

## *Open Forum*

## *Closing*

DR. JOHN BONNER

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## **ABSTRACT**

Quantifying energy issues associated with agricultural systems, even for a two-crop corn (*Zea mays* L.) and soybean (*Glycine max* [L.] Merr.) rotation, is not a simple task. It becomes even more complicated if the goal is to include all aspects of sustainability (i.e., economic, environmental, and social). This Issue Paper examines energy issues associated with and affecting corn/soybean rotations by first defining the size of the system from both a U.S. and global perspective and then establishing boundaries based on the Farm Bill definition of sustainability. This structured approach is essential to help quantify energy issues within corn/soybean systems that are themselves best described as “systems of systems” or even “systems within ecosystems” because of their complex linkages to global food, feed, and fuel production. Two key economic challenges at the field and farm scale for decreasing energy use are (1) overcoming adoption barriers that currently limit implementation of energy-conserving production practices and (2) demonstrating the viability of sustainable bioenergy feedstock production as part of a landscape management plan focused not only on corn/soybean production but on all aspects of soil, water, and air resource management. It is also important to look beyond direct energy consumption to address the complex economics affecting energy issues associated with corn/soybean systems. To help address the complex energy issue, life cycle assessment is used as a tool to evaluate the impact of what many characterize as a simple production system.

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## **SPEAKER BIOGRAPHY**

**Doug Karlen, Ph.D.**, is a supervisory soil scientist with the USDA–ARS at the National Laboratory for Agriculture and the Environment in Ames, Iowa, where he serves as research leader for the Soil, Water, and Air Resources Research Unit. He also serves as co-leader for the ARS Renewable Energy Assessment Project (REAP) team, a multi-location effort focusing on sustainability of harvesting crop residues for bioenergy, and as coordinator for a Regional Partnership through which REAP and several university partners are assessing sustainability of corn stover harvest strategies. He served on a National Academy of Sciences Panel associated with the America’s Energy Future project and was a contributing author for the “Alternative Liquid Transportation Fuels” chapter. His research program uses soil quality assessment as a tool to quantify effects of soil and crop management practices including tillage, crop rotation, nutrient management, manure management, and, most recently, crop residue removal on the sustainability of agricultural management systems. Karlen is author or co-author for 186 refereed journal articles and more than 125 refereed proceedings, book chapters, and nontechnical publications. He is a Fellow of the American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, and Soil and Water Conservation Society. He currently serves as Secretary General for the International Soil and Tillage Research Organization and is an adjunct Professor in the Department of Agronomy at Iowa State University in Ames and with the Department of Entomology, Soils and Plant Sciences at Clemson University in Clemson, South Carolina. He is a Wisconsin native and holds B.S., M.S., and Ph.D. degrees from the University of Wisconsin, Michigan State University, and Kansas State University, respectively.

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