Agriculture’s Role in the New Carbon Economy

Charles W. Rice
Department of Agronomy

Falkowski et al. 2000

We have left the domain that defined the Earth system for the 420,000 years before the Industrial Revolution

Source: Petit et al. 1999
UNFCCC Bali
Dec 2007

• Enhanced national/international action on mitigation of climate change
• Measurable, reportable and verifiable nationally appropriate mitigation commitments or actions
Agriculture

- A large proportion of the mitigation potential of agriculture (excluding bioenergy) arises from soil C sequestration, which has strong synergies with sustainable agriculture and generally reduces vulnerability to climate change.

- Agricultural practices collectively can make a significant contribution at low cost
  - By increasing soil carbon sinks,
  - By reducing GHG emissions,
  - By contributing biomass feedstocks for energy use
Biofuel Production Concerns

- Changes in land use, and potential conversion of conservation lands to biomass production.
- Impact on soil carbon
- Changes in water needs, availability, and water quality impacts.
- Competition for grains and oilseeds and impacts on food and feed availability and prices.
- Lifecycle analyses and GHG/C accounting for biofuels production.
- Assessing co-benefits of biofuel production, such as soil quality, reduced erosion from marginal crop lands, and enhanced wildlife benefits.

Progress in Measuring and Monitoring

- Nitrous oxide monitoring in agriculture – Cesar Izaurralde, Pacific NW National Lab
- COMET and scaling up issues – Rich Conant, Colorado State University
- Comparison of C measuring techniques – Cesar Izaurralde, Pacific NW National Lab
- VERIS technology for measuring carbon – Eric Lund, VERIS Technologies
- Carbon trading programs for agriculture – Nathan Clark, Chicago Climate Exchange

Biofuels and the Global Carbon Balance

• Resource assessment needs, sustainability issues, and life-cycle standards associated with biofuels development – Richard Nelson, KSU

• Modeling the impact of cellulosic ethanol production on soil carbon – Scott Staggenborg, KSU

• California’s Global Warming Solutions Act: How Does It Impact Agriculture? – Cynthia Cory, California Farm Bureau

• Environmental impact of climate change on Kansas – Johannes Feddema, Univ. of Kansas

Agriculture’s Challenge: Mitigating and Adapting to Climate Change

• Economics of ethanol industry adopting cellulosic technology – Mike Woolverton, KSU

• Soil carbon sequestration in Brazil – Telmo Amado, Universidade Federal de Santa Maria, Brazil

• IPCC Report and the Nobel Peace Prize – Chuck Rice, KSU
Chuck Rice
Phone: 785-532-7217
Cell: 785-587-7215
cwrice@ksu.edu

- Websites
  - www.soilcarboncenter.k-state.edu/
  - www.oznet.ksu.edu/kccm
  - www.oznet.ksu.edu/ctec
  - www.casmgs.colostate.edu/

K-State Research and Extension