Agricultural Research Service Update

September 30, 2010

Dr. Kent O. Burkey
USDA-ARS Plant Science Research Unit
Raleigh, NC

Recent Activities

- **ARS & Innovation Center for US Dairy – Dairy Research Institute Meeting in Marshfield, WI**
  - Presentations
    - Dairy Industry Life Cycle Assessment Project
    - ARS & DRI research capabilities
    - Current research for improving environmental performance of dairy industry
  - Dairy Industry Sustainability Research Collaboration
    - ARS, DRI, University
    - GHG priority focus
  - ARS Dairy Sustainability Working Group organization
    - Animal Systems GRACEnet

Recent Activities

- **Global Research Alliance (GRA) Meeting in Wellington, NZ**
  - GRA announced by Secr. Vilsack in Copenhagen 12/09
  - GHG mitigation from agricultural systems (groups)
    - Cropping Systems
    - Animal Systems
    - Rice Systems
  - Animal Systems GRA Meeting Banff, Canada 10/10
  - Crop Systems GRA Meeting Long Beach, CA 11/10
    - GRACEnet as "cornerstone" activity?
    - 1st Priorities: Measurement standardization, Carbon and nitrogen cycling in soil

Climate Change Research

in the USDA-ARS Plant Science Research Unit, Raleigh, NC

Research Leader

David Marshall

Air Quality and Climate Change Scientists

Kent Burkey (Plant Physiologist and Lead Scientist)

Fitz Booker (Plant Physiologist)

Ed Fiscus (Plant Physiologist)

Amy Burton (Post-doc)

Collaborators

Shuijin Hu – NC State University (soil microbiology and carbon sequestration)

Gail Wilkerson – NC State University (crop modeling)

David Marshall – USDA/ARS (climate change effects on plant-pathogen interactions)

Gina Brown-Guedira – USDA/ARS (climate change effects on plant-pathogen interactions)

Alan Jones – UNC Chapel Hill (Arabidopsis genetics related to ozone tolerance)

Tommy Carter – USDA/ARS (abiotic stress tolerance in soybean)

Jim Orf – University of MN (abiotic stress tolerance in soybean)

Climate Change Research

in the USDA-ARS Plant Science Research Unit, Raleigh, NC

Assess and parameterize plant growth models for effects of temperature, atmospheric vapor pressure, elevated carbon dioxide, and ozone

Open top chambers

Air exclusion system prototype

Climate Change Research

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Assess interactive effects of temperature, atmospheric vapor pressure, elevated carbon dioxide and ozone on plant-pathogen interactions

Outdoor Plant Environment Chambers

Wheat stem rust

Climate Change Research

in the USDA-ARS Plant Science Research Unit, Raleigh, NC

Soybean germplasm for development of stress tolerant cultivars

Soybean ancestors exhibit diversity in tolerance to aluminum, drought, iron deficiency chlorosis, ozone, and salt stress

6-day exposure to 75 ppb ozone

Fiskeby III (tolerant) x Mandarin Ottawa (sensitive)

↓

Random inbred lines

↓

Map abiotic stress genes

Thank you

Kent.burkey@ars.usda.gov
Charlie.walthall@ars.usda.gov