Biological Systems Simulation Conference

March 8-10, 2004
Gainesville, Florida

Organized by:

UNIVERSITY OF FLORIDA
IFAS

BSSG
Biological Systems Simulation Group
Biological Systems Simulation Conference

Conference Co-Chairpersons

Dr. Kenneth J. Boote
Agronomy Department
University of Florida
P.O. 110500
Gainesville, FL 32611-0500
Phone (352) 392-1811, ext 231
FAX (352) 392-1840
KJB@mail.ifas.ufl.edu

Dr. James W. Jones
Department of Agricultural and Biological Engineering
University of Florida
P. O. 110570
Gainesville, FL 32611-0570
Phone (352) 392-1864, ext 289
JWJones@mail.ifas.ufl.edu

Dr. L. T. (Ted) Wilson
Professor and Center Director
Texas A & M University System
Agricultural Research and Extension Center
1509 Aggie Drive
Beaumont, TX 77713
Phone (409) 752-2741
Lt-wilson@aesrg.tamu.edu

Presentation Formats

- Oral Presentations
- Poster Presentations
- Software Demonstrations

Presentation Categories Solicited

- Simulating Plant-Level Biological Processes
- Simulating Soil Water, Nutrient, and Energy Balance in the Field
- Simulating Terrestrial Carbon Sequestration
- Assessing Impacts of Biotic Pests on Crop Performance
- Management and Decision Support Systems
- Modeling Effects of Climatic Variability on Crop Performance
- Modeling Climate Change Effects on Crops: Improving the Mechanisms
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PROGRAM

SUNDAY – MARCH 7, 2004

4:00pm - 6:00pm On-Site Registration
The Hilton University of Florida Conference Center

MONDAY – MARCH 8, 2004

7:00am - 5:30pm Registration
7:30am - 6:00pm Poster Display – Dogwood Room
7:30am – 8:30am Morning Refreshments – Century Ballroom B & C
7:30am – 10:00am Poster Set-up – Dogwood Room

8:30am – 5:00pm General Session – Century Ballroom B & C

8:30am – 8:40am Introductory Remarks - K. J. Boote, Professor, University of Florida, Gainesville, FL.

8:40am – 9:00am Welcome to University of Florida and Institute of Food and Agricultural Science - James M. Davidson, Professor-Emeritus, formerly Vice-President, University of Florida, Gainesville, FL.

Session 1 Modeling Effects of Climate and Climatic Variability on Crop Performance, Program Chair, James W. Jones, University of Florida, Gainesville, FL.

9:00am – 9:20am Climatic Information System, Lloyd T. Wilson, Yubin Yang, and Peter Lu, Texas A & M University System, Agricultural Research & Extension Center, Beaumont, TX.

9:20am – 9:40am Responses of Agricultural Crops to Free-Air CO₂ Enrichment, Bruce Kimball, USDA-ARS, U.S. Water Conservation Lab, Phoeniz, AZ.

9:40am-10:00am Large-Area Modelling of the Impact of Climate Variability on Tropical Annual Crops, Andrew J. Challinor, T. R. Wheeler, J. M. Slingo, P. Q. Craufurd, T. M. Osborne, and D. I. F. Grimes, University of Reading, United Kingdom.

10:20am – 10:40am Discussion

10:40am – 11:00am Refreshment Break

**Session 2**  *Simulating Evapotranspiration and Water Use*, Program Chair, Shrikant S. Japtap, University of Florida, Gainesville, FL.

11:00am-11:20am  *Hourly and Daytime Evapotranspiration from Grassland Using Radiometric Surface Temperatures*, Ayman A. Suleiman, Hampton University, Hampton, VA.

11:20am-11:40am  *Simulating Peanut Irrigation Water Use and Yield in Farmers’ Fields in Southwest Georgia*, Axel Garcia y Garcia, L. C. Guerra, G. Hoogenboom, J. E. Hook, and K. A. Harrison, University of Georgia, Griffin, GA.

11:40am-12:00pm  *A Genetic Algorithm Based Decision Support System to Explore Options in Water Management*, Amor V. M. Ines1, Kiyoshi Honda2, and Peter Droogers3, 1IRI, Columbia University, New York, NY, 2Asian Institute of Technology, Bangkok, Thailand, and 3FutureWater, Arnhem, Netherlands.

12:00pm-12:20pm Discussion

12:20pm-2:00pm Luncheon – Albert’s Restaurant

**Session 3**  *Using Systems Models in Production Situations*, Program Chair, Jeffrey T. Baker, USDA-ARS, Big Spring, TX.

2:00pm-2:20pm  *Deficit Irrigation, Seeding Practices, and Cultivar Maturity Effects on Simulated Grain Sorghum Yield*, R. Louis Baumhart, and Terry A. Howell, USDA-ARS Cons. & Prod. Res. Lab, Bushland, TX.


2:40pm-3:00pm  *Computer Modeling of Stored Grain Aeration Strategies*, Canchun Jia, and T. J. Siebenmorgen, University of Arkansas, Fayetteville, AR.
3:00pm-3:20pm  Discussion

3:20pm-3:40pm  Refreshment Break

**Session 4**  
*New Crop Growth Models and Algorithms*, Program Chair, **Jon D. Lizaso**, Iowa State University, Ames, IA.

3:40pm-4:00pm  *Modifying the Code of CROPGRO to Predict Growth of a Perennial Tropical Forage Grass*, **Stuart J. Rymph**, and **K. J. Boote**, University of Florida, Gainesville, FL.

4:00pm-4:20pm  *Development of a Rainfall / Runoff Partitioning Simulation Model to Study Infiltration in a West African Cropping System*, **Valerie K. Walen**\(^1\), **J. W. Jones**\(^1\), and **M. D. Doumbia**\(^2\), \(^1\)University of Florida, Gainesville, FL, and \(^2\)IER, Bamako, Mali.


4:40pm-5:00pm  Discussion

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**TUESDAY – MARCH 9, 2004**

7:30am - 5:30pm  Registration

7:30am - 6:00pm  Poster Display – *Dogwood Room*

7:30am – 8:20am  Morning Refreshments – *Century Ballroom B & C*

**Session 5**  
*Methods and Techniques in Crop-Soil Systems Modeling*, Program Chair, **K. J. Boote**, University of Florida, Gainesville, FL.


8:40am – 9:00am  *Evaluation of Cultivar Coefficients Derived From Peanut Variety Trials with On-Farm Monitoring Data*, **Larry C. Guerra**, A. **Garcia y Garcia**, and G. **Hoogenboom**, University of Georgia, Griffin, GA.
9:00am – 9:20am  

9:20am – 9:40am  

9:40am – 10:00am  
Discussion

10:00am – 10:20am  
Refreshment Break

**Session 6  

10:20am – 10:40am  
**Ensemble Kalman Filter Estimation of Spatiotemporal Soil Carbon Dynamics in a Semi-Arid Rotational Grazing System**, W. McNair Bostick¹, Oumarou Badini², J. W. Jones¹, C. O. Stockle³, and Amadou Kodio², ¹University of Florida, Gainesville, FL, ²IER, Mopti, Mali, and ³Washington State Univ., Pullman, WA.

10:40am – 11:00am  
**Estimating Soil Carbon in Agricultural Systems Using Ensemble Kalman Filter and DSSAT-CENTURY**, Jawoo Koo¹, W. M. Bostick¹, J. W. Jones¹, A. J. Gijsman¹, and J. B. Naab², ¹University of Florida, Gainesville, FL, and ²SARI, Wa, Ghana.

11:00am – 11:20am  

11:20am-11:40am  
Discussion

11:40am – 2:00pm  
Box Lunch and Field Trip to Irrigation Research and Education Park

**Session 7  
Decision Support Systems**, Program Chair, R. Andres Ferreyra, University of Florida, Gainesville, FL.

2:00pm – 2:20pm  
2:20pm – 2:40pm  Development of an Expert System for Irrigation Management of Citrus, Lingzheng Wu¹, K. T. Morgan¹, J. M. S. Scholberg¹, T. A. Wheaton¹, H. W. Beck¹, T. A. Obreza¹, and P. A. Brown². ¹University of Florida, Gainesville, FL, and ²University of California, Davis, CA.

2:40pm – 3:00pm  Decision Support Systems for Management Planning in Arable Farms, C. Aubry¹, M. H. Chatelin², Chantal Loyce³, and F. Papy¹, ¹INRA-UMR-SAD-APT, Paris, France, ²INRA-LORIA, Lvry, France, and ³INRA-INA-P-G-UMR-Agronomie, Grignon, France.


3:20pm - 3:40pm  Discussion

3:40pm - 4:00pm  Refreshment Break

Session 8  Poster and Software Session - Dogwood Room

4:00pm – 6:00pm  Authors to stand by their posters and demonstrate software.


P2  Photosynthesis and Yield of a US Rice Cultivar in Response to CO₂ and Temperature, J. T. Baker¹, S.-H. Kim², D. C. Gitz², D. Timlin², and V. R. Reddy², ¹USDA-ARS, Big Spring, TX, and ²USDA-ARS, Beltsville, MD.

P3  Houston... We Have a Program! Space Agriculture in the Classroom 6th Grade Curriculum, K. A. Bellah, S. G. Washburn, E. W. Osborne, J. E. Dyer, G. D. Israel, and E. Rhoades, University of Florida.

P4  Simulating Residual Effects of Animal Manures Using 15N Isotopes, J. Berntsen, B. M. Petersen, J. E. Olesen, and P. Sorensen, Danish Institute of Agric. Sciences, Tjele, Denmark.

Modeling Radiation Use and Dry Matter Partitioning in Grass Swards by Calibration to Field Data, H. Eckersten 1, B. Torssell 1, and A. Kornher 2, 1Swedish University of Agric. Sciences, Uppsala, Sweden, and 2Christian-Albrechts-Universitat, Kiel, Germany.


A Simulation Model of Cotton Growth and Development for CSM, Carlos D. Messina 1, P. B. Ramkrishnan 1, J. W. Jones 1, K. J. Boote 1, G. Hoogenboom 2, and J. T. Ritchie 1, 1University of Florida, Gainesville, FL, and 2University of Georgia, Griffin, GA.

Conditions of Biological Carbon Circulation, I. Pavlyshak, Stryy Institute of Agroecology and Biotechnology, Stryyy, Ukraine.

Modelling Long Term Soil Carbon and Radiocarbon Dynamics with CN-SIM, Bjorn M. Petersen and J. Berntsen, Danish Inst. Of Agric. Sciences, Foulum, Denmark.


The Impact of Climate Variability on Yield of Maize Grown Off-Season in the State of Sao Paulo Brazil, C. M. T. Soler 12, P. C. Sentelhas 2, and G. Hoogenboom 1, University of Georgia, Griffin, GA, and University of Sao Paulo, Sao Paulo, Brazil.

The Main Aspects of Environmental biotic Regulation, V. Stefyuk, Stryy Institute of Agroecology and Biotechnology, Stryyy, Ukraine.
A Mechanism Net Primary Production Model at Watershed Scale in Hilly Area of Loess Plateau, China, Hongmei Xu¹, Haikun Jia², Qingzhu Gao³, and Qiong Gao². ¹Nat’l Climate Ctr., Beijing, China, ²Beijing Normal University, Beijing, China, and ³Chinese Academy of Agric. Sciences, Beijing, China.

Modeling Hard Clam Production Responsive to Water Quality Data, B. T. Loughran and C. L. Montague, University of Florida, Gainesville, FL.

DK-C&N--A Simulation Model for C and N Mineralization Using the Approach of Dynamic Rate Constant, Haishun S. Yang, A. Dobermann, K. G. Cassman, and D. Walters, University of Nebraska, Lincoln, NE. – (Poster and Software Demonstration).


WEDNESDAY – MARCH 10, 2004

7:30am – 11:00am Registration
7:30am - 4:00pm Poster Display – Dogwood Room
7:30am – 8:20am Morning Refreshments – Century Ballroom B & C

Session 9  Modeling Impact of Biotic Pests, Program Chair, William D. Batchelor, Iowa State University, Ames, IA.

8:20am – 8:40am Business meeting, Biological Systems Simulation Group
8:40am – 9:00am Discussion of posters (Authors available at podium)
9:00am – 9:20am Quantifying Yield Losses Caused by Leafspot Disease on Peanut in Ghana: A Crop Modeling Analysis, Jesse B. Naab¹, F. K. Tsigbey¹, P. V. V. Prasad², K. J. Boote², and J. W. Jones². ¹Savanna Agricultural Research Institute, Nyankpala, Ghana, and ²University of Florida, Gainesville, FL.

9:20am – 9:40am CROPGRO-Peanut Model: A Tool to Simulate Growth and Yield Losses Due to Foliar Diseases on Peanut in Benin, Moustapha Adomou¹, P. V. V. Prasad², K. J. Boote², and J. Detongnon¹. ¹INRAB, Cotonou, Benin, and ²University of Florida, Gainesville, FL.
9:40am – 10:00am  *A Mechanistic Approach to Predict Pre-Harvest Aflatoxin Incidence in Peanut Using CROPGRO-Peanut Model*, P. V. V. Prasad¹, K. J. Boote¹, F. Walijar², and P. Q. Craufurd³, ¹University of Florida, Gainesville, FL, ²ICRISAT, Hyderabad, India, and ³University of Reading, UK.

10:00am-10:20am  Discussion

10:20am-10:40am  Refreshment Break

10:40am – 11:00am  *Gibsim, a Risk Model for Fusarium Head Blight of Wheat*, J. Mauricio Fernandes, W. Pavan, and E. M. Del Ponte, Embrapa Trigo, Passo Fundo, Brazil.

11:00am – 11:20am  *A 3-Dimensional Spatial Model for Simulating Insect Dispersal and Population Dynamics in Stored Rice*, Yubin Yang¹, L. T. Wilson¹, Frank Arthur¹, and Jim Medley², Texas A & M University System, Beaumont, TX, and ²USDA-ARS-GMPRC, Manhattan, KS.

11:20am – 11:40am  *The Response of Kernel Number to Stress in a Maize Hybrid and its Parental Inbred Lines*, L. Echarte and Thjis Tollenaar, University of Guelph, Ontario, Canada.

11:40am – 12:00pm  Discussion

12:00pm – 1:20pm  Luncheon – Albert’s Restaurant

**Session 10**  *Modeling Climate Change Effects: Improving the Mechanisms in Maize and Soybean Models*, Program Chair, Bruce Kimball, USDA-ARS, U.S. Water Conservation Lab., Phoenix, AZ.

1:20pm – 1:40pm  *Enhancing the Simulation of Processes in CERES-Maize for Climate Change Assessment: Kernel Numbers, Light Capture, Leaf Area, Photosynthesis and Respiration*, Jon D. Lizaso, and W. D. Batchelor, Iowa State University, Ames, IA.

1:40pm – 2:00pm  *Test of the HYBRID-MAIZE Model for Simulation of Soil Moisture Dynamics and Maize Response to Water Deficit*, Haishun S. Yang, A. Dobermann, K. G. Cassman, K. G. Hubbard, T. Arkebauer, S. Verma, and D. Walters, University of Nebraska, Lincoln, NE.
2:00pm – 2:20pm  An Evaluation of GLYCIM After Nine Years of On-Farm Trials: Why Does GLYCIM Often Predict Higher Than Measured Yields?, Dennis Timlin¹, L. Pachepsky¹, Y. Pachepsky¹, F. Whisler², V. R. Reddy¹, and D. Fleisher¹, USDA-ARS Alternate Crops and Systems Laboratory, Beltsville, MD, and Miss. State Univ, Starkville, MS.

2:20pm – 2:40pm  Evaluating the CROPGRO-Soybean Model for Predicting Yield Response to Carbon Dioxide Levels, Gopal Alagarswamy¹, J. K. Boote¹, J. W. Jones¹, and L. H. Allen, Jr.², University of Florida, Gainesville, FL, and USDA-ARS, Gainesville, FL.

2:40pm – 3:00pm  The Origins of Temperature Functions for Processes in CROPGRO-Soybean, K. J. Boote¹, J. W. Jones¹, G. Hoogenboom², A. DuToit¹, E. L. Piper¹, P. J. Sexton¹, and F. Sau³, University of Florida, Gainesville, FL, University of Georgia, Griffin, GA, and Univ. Santiago de Compostela, Lugo, Spain.

3:00pm – 3:20pm  Discussion

3:20pm – 3:40pm  Refreshment Break

3:40pm – 4:00pm  Poster Removal – Dogwood Room

4:00pm  Conference Concludes - Adjourn