

Agriculture & Engineering for a Healthier Life

INTERNATIONAL CONFERENCE OF AGRICULTURAL ENGINEERING

CIGR-AgEng2012

Valencia Conference Centre
July 8-12, 2012. Valencia, Spain.

Final Programme



ORGANIZERS

SUPPORT



<http://cigr.ageng2012.org>

WELCOME TO CIGR-AGENG 2012



On behalf of the European Society of Agricultural Engineers (EurAgEng), the International Commission of Agricultural and Biosystems Engineering (CIGR), and the Spanish Society of Agroingeniería (SEAgIng), welcome to the International Conference of Agricultural Engineering CIGR-AgEng2012 here in Valencia, Spain on July 8-12, 2012.

EurAgEng and CIGR celebrate this joint International Conference on Agricultural Engineering in 2012. In addition, a Special Parallel Conference on mechanisation and post-harvest technology in developing countries organized by UNIDO and FAO forms a part of the Congress.

The Conference covers emerging research and new engineering solutions for food production and rural activities, as a means to enhance human well-being and promote social benefits. New concerns include methods of agricultural, livestock and forestry production, and the preservation of natural resources and landscape by applying modern engineering concepts. Healthier production systems need to encompass higher social and economic benefits.

The CIGR-AgEng2012 Conference is aimed at academia, industry, producers, manufacturers and service providers from all over the world for discussion about novel approaches to integrate agriculture and engineering for enhancing the quality and expectancy of life. PhD students, Delegates of CIGR and EurAgEng, Representatives of Developing Countries and Industry are especially encouraged to participate in CIGR-AgEng 2012 Conference.

I am looking forward to meeting you in July for CIGR-AgEng2012 in Valencia, Spain.

Florentino Juste
Past-President EurAgEng
President of CIGR-AgEng2012 Conference



AgEng2012 takes place in Valencia, Spain, one of the most famous cities in Europe, and known as a leading trading place since the new world was discovered. Valencia is now a university city and capital of a region with various scientific institutions. Participants will meet in a modern conference venue, adjacent to a historic city with many tourist attractions and in a region with diverse agriculture.

Diverse agriculture is characteristic of Europe too. A wide variety of advanced technologies are needed to cope with the economic conditions of farmers and with the requirements of society in industrialized countries. These requirements aim to save precious resources and produce environmentally friendly and healthy food. As technology is part of farming, engineering must contribute to the development of advanced and efficient agricultural practices.

The conference offers a wide range of topics for presentations on agricultural and biosystems engineering subjects and there will be time for discussion, for initiating collaborations and for developing ideas for innovations. EurAgEng working groups, which will be organized as part of the conference, will give additional opportunities for deeper discussion on specific fields of interest and for initiation of joint activities between European research institutions and industries.

Peter Schulze Lammers
EurAgEng President 2010-2012



The mission of CIGR is to serve the needs of humanity world-wide, by fostering mutual understanding, continuous improvement and rationalization of sustainable biological production systems. CIGR seeks to improve the quality of life for all while protecting the environment through the application and advancement of engineering and science.

Since its foundation in 1930, a primary goal of CIGR has been to foster international cooperation. The 2012 International Conference of Agricultural Engineering will play a fundamental role in support of this goal.

This conference provides a forum for engineers, scientists and associated professionals to exchange knowledge, information and experience related to new developments in agriculture and biosystems. More importantly, it provides a networking platform for professionals to establish long term working relationships that result in improvements in the quality of life of those we serve, and which support sustainability of biological production systems and related industries.

The CIGR Presidium would like to recognize EurAgEng, the organizing committee and the participants in this conference for their hard work and willingness to share knowledge and experience to the benefit of all.

Fedro S. Zazueta
President, CIGR

KEYNOTE SPEAKERS GENERAL SESSIONS

MONDAY



Christopher WATHES

Towards livestock production in the 21st Century: a perfect storm averted?

Date: Monday 9th July 9:00-10:00

Venue: Valencia Conference Centre (VCC)

Location: Auditorio1

Special Professor in the School of Life and Environmental Sciences, Nottingham,

Head of Bioengineering Division and then Director of Science, Silsoe Research Institute (UK) and Professor of Animal Welfare, at The Royal Veterinary College, UK.

TUESDAY



John F. REID

Current and future applications of robotics and automation to agriculture

Date: Tuesday 10th July 8:00 - 9:00

Venue: Valencia Conference Centre (VCC)

Location: Auditorio 1

Dr. John F. Reid is Director, Product Technology and Innovation at the Moline Technology Innovation Centre (MTIC), John Deere. Dr. Reid received his BS ('80) and MS ('82) from Virginia Tech in Agricultural Engineering and his doctorate ('87) from Texas A&M in Agricultural Engineering.

WEDNESDAY



Geoffrey C. MREMA

The role of technology in the developing countries

Date: Wednesday 11th July 8:00 - 9:00

Venue: Valencia Conference Centre (VCC)

Location: Auditorio 1

Professor Geoffrey C. Mrema, from Tanzania, holds a B.Sc. degree in Mechanical Engineering (Hons) from the University of Nairobi; M.Sc. and PhD in Agricultural Engineering from the University of Newcastle-upon-Tyne, UK, and University College, Dublin, Ireland respectively. In February 2005, Dr. Mrema was appointed FAO's Sub-Regional Representative for Southern and Eastern Africa based in Harare, Zimbabwe. In 2006 he returned to the FAO headquarters as Director of the Rural Infrastructure and Agro-Industries Division (AGS), until his retirement in 2011. He is now based at the Department of Agricultural Engineering and Land Planning of SUA where in addition to lecturing and research, he undertakes consultancy missions for international and national agencies.

TECHNICAL SPEAKERS

MONDAY

SPECIAL PARALLEL CONFERENCE-02: First international symposium on computational fluid dynamics (CFD) applications in agriculture (ISHS working group on CFD, CIGR technical section II and ASABE committee SE-303) SESSION 111 FOOD ENGINEERING AND PROCESSING



In-Bok Lee

Date:
Monday 9th,
10:20-11:55
Venue:
Valencia Conference Centre
(VCC)
Location: Room 2

Mr. In-Bok Lee is currently Chair of Rural Systems Engineering Department, College of Agriculture and Life Sciences of Seoul National

University (SNU). Other responsibilities At present, he is Vice President of Korea Society of Agricultural Engineers (KSAE), Chair of the CFD Working Group in International Society for Horticultural Science (ISHS), Editorial member of Biosystems Engineering, and also member of professional and international organizations like ASAE and CIGR.

His laboratory (Aero-Environmental & Energy Engineering Laboratory -A3EL) works on aerodynamics and energy engineering in the agricultural field, focusing on three major fields: 1) environmental control (especially ventilation) of agricultural buildings such as greenhouses and livestock houses, 2) atmospheric dispersions of aerosol, airborne disease, and gas (odor), and 3) renewable energy and energy saving technology.

To this date, he and his team have published 45 (SCI) International journals and 31 Domestic journals publications.

SPECIAL PARALLEL CONFERENCE-07: Silos and granular materials (SIGMA) SESSION 112 SILOS LOADING



Alan Roberts

Date:
Monday 9th July,
10:20-11:55
Venue:
Valencia Conference Centre
(VCC)
Location: Room 3

In his 50-year career, Alan Roberts has published seminal technical papers and combined a glittering academic career with practical industry problem-solving. However, despite his retirement, Alan has maintained a brisk pace of work. His research interests continue, while he teaches short courses in Australia, Canada and the US.

SPECIAL PARALLEL CONFERENCE-03: IV INTERNATIONAL WORKSHOP ON COMPUTER IMAGE ANALYSIS IN AGRICULTURE SESSION 114 PLANT INSPECTION



Bosoon Park

Date:
Monday 9th,
10:20-11:55
Venue:
Valencia Conference Centre
(VCC)
Location: Room 8+9

Dr. Bosoon Park is a Lead Scientist at Richard B. Russell Research Center, U.S. Department of Agriculture, Agricultural Research Service in Athens, Ga. He is the author and co-author over 221 articles including patents, book chapters, peer-reviewed jour-

nals, and proceedings on bio-instrumentation, bio-imaging as well as nanotechnology for food safety and quality. He is an Associate Editor of Transactions of the ASABE and Applied Engineering in Agriculture, and serves on Editorial Board on journal of Sensing and Instrumentation for Food Quality and Safety. He holds several honorary and scientific memberships including Sigma Xi, Alpha Epsilon, ASABE, SPIE, ACS, AAAS, IFAC, and CNIR. Currently, he holds Adjunct Faculty at the University of Georgia.

SPECIAL PARALLEL CONFERENCE-06: Applications of smart sensors and wireless sensor networks (WSN) in PLF
SESSION 151 Wireless Communication in Agriculture



Vahid Tarokh

Date:
Monday 9th,
15:25-15:55
Venue:
Valencia Conference Centre
(VCC)
Location: Room 5

Vahid Tarokh received a Ph.D. degree in Electrical Engineering in 1995. He worked at AT&T Labs-Research and AT&T Wireless Services

until 2000 where he was (in chronological order) Senior Member of Technical Staff, Principal Member of Technical Staff and Head of Department of Wireless Communications and Signal Processing

TUESDAY

SPECIAL PARALLEL CONFERENCE-05: The Ninth International Livestock Environment Symposium (ILES IX)

SESSION 203 OVERVIEW OF MEASUREMENT AND VERIFICATION PROTOCOLS IN LIVESTOCK ENVIRONMENTS



Peter Engel

Date:
Tuesday 10th July,
8:55-10:30
Venue:
Valencia Conference Centre
(VCC)
Location: Auditorio 2

Mr. Peter Engel has more than 17 years of professional experience within the environmental sector. In 2011 he was appointed as head of the international VERA secretariat. The secretariat is hosted in Denmark at the Danish Standard Foundation on behalf of the Danish Environmental Protection Agency. Mr. Engel has worked with environmental technology throughout his entire career both on a theoretical and a practical level.



Nico W.M. Ogink

Date:
Tuesday 10th,
8:55-10:30
Venue:
Valencia Conference Centre
(VCC)
Location: Auditorio 2

Nico Ogink is researcher at Livestock Research of Wageningen UR. His expertise and research themes are related to livestock and environment issues, with a focus on measuring emissions from livestock operations and understanding underlying processes in the main animal categories. He is engaged in developing and eva-

luating new mitigation methods for ammonia, odour and fine dust emissions. During the last 3 years he has been leader of an extensive research program to provide practical mitigation options for fine dust emissions from poultry farms.



Hongwei Xin

Date:
Tuesday 10th July,
8:55-10:30
Venue:
Valencia Conference Centre
(VCC)
Location: Auditorio 2

Dr. Xin is a professor in the Departments of Agricultural and Biosystems Engineering (ABE) and Animal Science at Iowa State University, ABE Associate Chair for Research, and director of the Egg Industry Center located at ISU.

Dr. Geuzaine is currently responsible for the development of business, the set-up of new research projects and partnerships, the definition of development roadmaps and the management as well as coaching of team leaders. He is member of the management committee. He also chairs the Industrial Programme Committee at ERCOFTAC.

SPECIAL PARALLEL CONFERENCE-02: FIRST INTERNATIONAL SYMPOSIUM ON COMPUTATIONAL FLUID DYNAMICS (CFD) APPLICATIONS IN AGRICULTURE

SESSION 209 INDOOR AEROLICS I



Dr. Philippe Geuzaine

Date:
Tuesday 10th,
8:55-10:30
Venue:
Valencia Conference Centre
(VCC)
Location: Room 2

COFTAC".

Dr. Philippe Geuzaine is a Research and Technology Manager at Cenaero, a Belgian private research center. He received his B.S. and Ph.D. from the University of Liège, Belgium. Before joining Cenaero in 2003 as a CFD-Multiphysics Group Leader, Dr. Geuzaine has been a Postdoctoral Research Associate at the University of Colorado at Boulder, USA.

With a strong background in computational fluid dynamics,

"Establishing quality and thrust in CFD through ER-

SCIENTIFIC PROGRAMME

MONDAY JULY 9

9:00-10:00 Christopher WATHES. Keynote Speaker General Session AUDITORIO1

101 SESSION

10:20 -11:55
(PM): TRACTORS
Moderator: Jaime Ortiz-Cañavate
Location: AUDITORIO I

- 10:20 Introduction
- 10:25 C-1008 ACTIVE BOGIES, CHASSIS LEVELLING AND TRANSMISSION EFFICIENCY FOR A VEHICLE OPERATING IN ROUGH TERRAIN
Marti Comellas
Marti Comellas, Jordi Pijuan Cases, Joan Roca, Xavi Potau
- 10:40 C-1340 OPTIMIZATION OF A THREE POINT HITCH IN AN AGRICULTURAL TRACTOR
Giovanni Molari
Giovanni Molari, Michele Mattetti, Adriano Guarnieri
- 10:55 C-1398 VEHICLE RIGID MOTION EFFECTS ON WHOLE BODY VIBRATION
Giovanni Molari
Giovanni Molari, Michele Mattetti, Matteo Badodi, Enrico Sedoni

- 11:10 C-1179 EXHAUST EMISSION CONTROL AND CO2 REDUCTION ON COMBINES AND TRACTOR IMPLEMENT COMBINATIONS
Peter Eckert
Peter Eckert, Tobias Töpfer, Jörn Seeboode, Lars Henning
- 11:25 C-1603 NEW CLASSIFICATION OF TRACTORS ACCORDING TO THEIR ENERGY EFFICIENCY
Jaime Ortiz-Cañavate Puig
Miguel Angel Muñoz-garcía, Jaime Ortiz-Cañavate Puig, Jacinto Gil-Sierra, Jesus Casanova, Alvaro Valle
- 11:40 C-2129 DEVELOPMENT AND CHARACTERIZATION TESTS OF A SMALL HYDRAULIC-POWERED TRACTOR PROTOTYPE FOR USE IN EXTREME SLOPED VINEYARDS
Fabrizio Mazzetto
Fabrizio Mazzetto, Renato Vidoni, Carlo Bisaglia, Raimondo Gallo

102 SESSION

10:20 -11:55
(SW-SPC01): EVAPOTRANSPIRATION AND IRRIGATION-REQUERIMENTS
Moderator: Alfonso Dominguez
Location: AUDITORIO 2

- 10:20 Introduction
- 10:25 C-0834 SURFACE RENEWAL ESTIMATES OF SENSIBLE HEAT FLUX: OPTIMIZATION FOR BANANA AND GRAPEVINE SCREENHOUSES
Josef Tanny
Yonathan Mekhmandarov, Moran Pirkner, Uri Dicken, Josef Tanny
- 10:40 C-0256 IMPACTS ON SOYBEAN SOIL WATER BALANCE AND YIELD DUE TO INCREASE IN TEMPERATURE AS SIMULATED BY CROPGRO
Rogério Faria de Teixeira
Rogério Teixeira de Faria, José Renato Zanini, Luiz Carlos Pavani
- 10:55 C-1648 IMPLEMENTING THE DUAL CROP COEFFICIENT APPROACH USING THE SIMDUALKC MODEL FOR THE SUMMER MAIZE IN THE NORTH CHINA: MODEL CALIBRATION AND VALIDATION
Luis S. Pereira
Zhang Baozhong, Liu Yu, Xu Di, Zhao Nana, Ricardo D. Rosa, Paula Paredes, Luis S. Pereira,
- 11:10 C-0665 FORETO: NEW SOFTWARE FOR REFERENCE EVAPOTRANSPIRATION FORECASTING
Rocio Ballesteros Gonzalez
Rocio Ballesteros Gonzalez, Jose Fernando Ortega Alvarez, Miguel Angel Moreno Hidalgo

140 SESSION

15:25 - 17:00
(SW-SPC01): PLANT WATER RELATIONSHIPS
Moderator: Diego Intrigliolo
Location: AUDITORIO 2

- 15:25 Introduction
- 15:30 C-1620 MODELS OF CROP GROWTH AND REMOTE SENSING FOR ESTIMATING CROP YIELD IN IRRIGATED AGRICULTURE
Enrique Palacios-Vélez
Enrique Palacios-Vélez, Luis Alberto Palacios-Sánchez, Enrique Mejía-Saenz
- 15:45 C-2065 EFFECT OF SUBSURFACE DRIP IRRIGATION ON MOISTURE DISTRIBUTION, ROOT GROWTH AND PRODUCTION OF CAULIFLOWER
Uday Khodke
Uday Khodke, D. B. Patil
- 16:00 C-1224 WICK IRRIGATION SYSTEM USING SELF-COMPENSATED BENCHES FOR LETTUCE PRODUCTION
Rhuanito Soranz Ferrarezi
Rhuanito Soranz Ferrarezi, Roberto Testezlaf
- 16:15 C-1536 IRRIGATION MANAGEMENT SYSTEM FOR OLIVE ORCHARDS AND VINEYARDS
Samuel Ortega-Farías
Samuel Ortega-Farías, Marcos Carrasco, Fernando Flores
- 16:30 C-2263 EFFECT OF CONSERVATION TILLAGE AND IRRIGATION METHODS ON THE CROP YIELD AND WATER USE EFFICIENCY IN WHEAT-CORN ROTATION
Sadegh Afzalnia
Sadegh Afzalnia, Ebrahim Dehghanian

141 SESSION

15:25 - 17:00
(SPC-05): BIOAEROSOLS AND AIRBORNE PATHOGENS
Moderator: Eileen Wheeler
Location: AUDITORIO 3A

- 15:25 Introduction
- 15:30 C-1300 DETECTION OF AIRBORNE SALMONELLA SPP. IN POULTRY FARMS USING IMPINGEMENT: CULTURE-DEPENDENT VS. CULTURE-INDEPENDENT METHODS
María Cambra-López
Elisa Adell, Verónica Maset, Yang Zhao, Ana Jiménez, Alba Cerisuelo, María Cambra-López

- 15:45 C-0998 SHEDDING AND EMISSION OF AIRBORNE VIRAL MICROORGANISMS FROM ANIMAL HOUSES
Yang Zhao
Yang Zhao, André J. A. Aarnink, María Cambra-Lopez, Teun Fabri
- 16:00 C-1281 ASSESSMENT OF INSTRUMENTATION EFFICIENCY FOR DETECTING AIRBORNE VIRUS
Taehwan Ha
Taehwan Ha, In-bok Lee
- 16:15 C-1567 **QUANTIFICATION OF ENVIRONMENTAL CONDITIONS IN AUSTRALIAN LIVESTOCK BUILDINGS**
Thomas Banhazi
Thomas Banhazi
- 16:30 C-1769 AIRBORNE PARTICLES IN ANIMAL HOUSES
Huong Lai
Huong Lai, André J. A. Aarnink, María Cambra-López, Thuy T. T. Huynh, Henk K. Parmentier, Peter W. G. Groot Koerkamp
- 16:45 C-0968 EMISSIONS AND CONCENTRATIONS OF DUST AND PATHOGENS FROM GOAT HOUSES
Andre Aarnink
André J. A. Aarnink, María Cambra-López, Hendrik Jan Roest, Yang Zhao, Julio Mosquera, Nico W. M. Ogink

142 SESSION

15:25 - 17:00
(SPC05): AMMONIA EMISSIONS FROM ANIMAL HOUSING
Moderator: Salvador Calvet
Location: AUDITORIO 3B

- 15:25 Introduction
- 15:30 C-2246 EMISSIONS CALCULATED FROM PARTICULATE MATTER AND GASEOUS AMMONIA MEASUREMENTS FROM A COMMERCIAL DAIRY IN CALIFORNIA, USA
Kori Moore
Kori Moore, Christian Marchant, Randy Martin, Michael Wojcik, Emyrei Young, Richard Pfeiffer, John Prueger, Jerry Hatfield,
- 15:45 C-2245 AMMONIA EMISSIONS FROM A PIG BREEDER FACILITY IN THE OKLAHOMA PANHANDLE
Ken Casey
Ken Casey, Erin Cortus, Al Heber, Al Caramanica

ORGANIZERS



SUPPORT



SUPPORTING ORGANIZATIONS



TECHNICAL SECRETARIAT



C. Universidad 4 - 46101 Valencia
Phone: +34 963 52 48 89 - Fax: +34 963 94 25 38
Web: www.geyseco.es - Email: cigr.ageng2012@geyseco.es

<http://cigr.ageng2012.org>