
Editorial

Dionysis D. Bochtis*

Department of Engineering,
Aarhus University,
Igne Lehmanns Gade 10,
DK-8000, Aarhus C, Denmark
Email: Dionysis.Bochtis@eng.au.dk
*Corresponding author

Patrizia Busato and Remigio Berruto

DEIAFA Department,
University of Turin,
10095 Grugliasco, Turin, Italy
Email: patrizia.busato@unito.it
Email: remigio.berruto@unito.it

Biographical notes: Dionysis D. Bochtis is an Associate Professor in the Department of Engineering at Aarhus University, Denmark. His primary research is engineering management focused on bio-production and related provision systems including activities relate to fleet management, field robots, supply chain management, ICT and automation, and decision support systems. He is the author of more than 200 articles in peer reviewed journals and conference proceedings and has been a key note speaker in scientific conferences. He is the Vice-Chair of the CIGR Section V (Systems Management) and was the President of CIOSTA organisation for 2011–2013 (Commission Internationale de l'Organisation Scientifique du Travail en Agriculture).

Patrizia Busato received her PhD degree at the University of Turin in 2008. Since 2008, she is a member of the Italian Association of Agricultural Engineers, and member of the American Society of Agricultural and Biological Engineers. Since 2010, she is a board member of CIGR Section VII – Information Technology. Her research mainly deals with web applications for energy balance assessment, discrete event simulation models for farm and supply-chain operations. She has attended more than 60 international conferences and has published over 100 papers in scientific journals and conference proceedings.

Remigio Berruto received his PhD in Agricultural System Management at Purdue University, Indiana, USA. Since 1990, he is working at the Department of Agricultural Engineering at the University of Turin. He is a member of the Italian Association of Agricultural Engineers and of the American Society of Agricultural and Biological Engineers (ASABE). He is the founder of the CIGR Working Group on Logistics, and Chairman of CIGR (International Association of Agricultural Engineers) – Section V – System Engineering and Ergonomics. His research activity focuses in systems analysis and simulation modelling of agrofood products distribution logistics, management software for agrofood industries and for traceability, sustainability of processes and production systems. He has published over 180 papers on journals and international conferences.

Production and provision of food and non-food agricultural products is considered as one of the leading economic sectors in Europe, in terms of turnover, value added, employment, and involved companies. On the other hand, the generated environmental footprint through the related processes is significant, as currently there is a high dependence on non-renewable energy resources. During the last decade, the implementation of advanced information technologies have transform agriculture from a traditionally labour-intensive production activity to a highly knowledge-intensive industrial activity. However, a prerequisite for the exploitation of this knowledge in the whole range of the decision making levels (i.e., strategic, tactical, operational, and execution) is the development and utilisation of innovative management approaches and systems.

This special issue contains extended peer reviewed selected papers form the 35th CIOSTA Conference held in Billund, Denmark in July 2013. CIOSTA is an international commission Founded in Paris at 1950, with its initials standing for: Commission Internationale de l'Organisation Scientifique du Travail en Agriculture. CIOSTA conferences focus on the optimisation of bio-production management based on systems engineering approaches and innovative technologies. Themes addressed in CIOSTA conferences include decision support systems, information management systems, precision farming-based operations planning, agrifood and biomass supply chains, under the aspect of sustainability. The latter term is the central point of the present special issue within all covered topics which includes in-door microclimatic conditions management, wildlife protection, agrifood supply chain management, machinery efficiency, and implementation of communication standards.

Agri-food supply chains are the topic addressed by Aidonis et al. ('Multi-criteria evaluation of sustainable supply chains in the agrifood sector'). Authors describe the development of a multi-criteria analysis approach that focuses on the prioritisation of agrifood supply chains with the use of specific socio-economic, technological and environmental criteria, where stakeholders' views (i.e., policy makers and experts) are incorporated in the analysis process. In the area of arable farming, the improved machinery efficiency results to decreased fuel consumption, and subsequently to decreased CO₂ emissions. Edwards et al. ('Coverage planning for capacitated field operations under spatial variability') present a real-time planning system for field operations which involve material flow that generates an optimal coverage path for the machine that executes the operation. Steen et al. ('An adaptive scaring device') address the problem of wildlife protection during agricultural production activities. The development of an adaptive bird scaring device is presented, which is able to recognise the behaviour of specific species based on their vocalisations and respond appropriately to this. Menconi et al. ('Optimisation of thermal performances in livestock housing design solutions using genetic algorithms') present an optimisation tool based on genetic algorithms that generates design solutions in terms of low-energy performance for livestock buildings. Another case of structured agricultural production system is the one of greenhouses. The issue of the greenhouse climate conditions control is addressed in Linker and Lousky ('A simulation study on the use of co-state variables as strategic setpoints for tomato greenhouses'), where authors developed a method for allocating control efforts between the climate-related actuators of a greenhouse control system. Finally, Piromalis and Arvanitis ('Radio frequency identification and wireless sensor networks application domains integration using DASH7 Mode 2 standard in agriculture') present the standards associated with the integration of the radio frequency identification

(RFID) and wireless sensor networks (WSN) technologies and the development of an architecture of the RFID and WSN domains integration from a system perspective targeted to support the ‘from farm to fork’ concept.

We would like to thank authors for their contribution to this special issue, and the reviewers for ensuring its quality. Also, we would like to thank Professor Basil Manos, Editor-in-Chief and Assistant Professor Zacharoula Andreopoulou, Executive Editor of the *International Journal of Sustainable Agricultural Management and Informatics*, for hosting and supporting our work. We hope that this special issue will promote the CIOSTA focal scientific areas and contribute the challenges for the integration of engineering management and advanced ICT towards sustainable production-provision systems for agricultural products.