

Bioproduction System for Circular Precision Integrated Farming to Encounter Climate Change - Abstract

Christos Dordas¹, Georgios Arsenos², Dionysis Bochtis³, Maria Laskari¹, George Menexes¹, Nikolaos Panousis², Ilias Kalfas⁴, Ioannis Gatzolis⁴, George Georgiadis⁴, Evdokia Krystallidou⁴

¹Laboratory of Agronomy, School of Agriculture, Aristotle University of Thessaloniki, Greece; e-mail: chdordas@agro.auth.gr

²Laboratory of Animal Husbandry, Faculty of Veterinary Medicine, Aristotle University of Thessaloniki, Greece

³Institute of Bio-economy and Agri-technology, Center for Research and Technology Hellas, 6th Charilaou Thermi Rd, 57001 Thessaloniki, Greece

⁴Strategic Project Management Office, American Farm School, 54 Marinou Antypa Street, 57001 Thessaloniki, Greece

Summary

Climate change is dictating natural environment and availability of natural resources. Agricultural activities contribute to greenhouse gas emission and pollution from nitrogen fertilizers used in modern agriculture. The cost of such activities is quite high and can reach up to 320 billion euros. The notion is that modern agriculture should adopt smart farming systems and smart processing methodologies to reduce its impact on climate change. Therefore, we developed BIOCIRCULAR, a multidisciplinary project linking circular economy, precision agriculture and livestock management with the overall aim to increase efficiency of resources utilization and reduce carbon footprint. The project was co-financed by the European Union and Greek national funds through the Operational Program Competitiveness, Entrepreneurship and Innovation, under the call RESEARCH – CREATE – INNOVATE. The partners that are involved are Aristotle University of Thessaloniki, Institute of Bio-economy and Agri-technology of the Center for Research and Technology Hellas, American Farm School, Engineers for Business, and Ergoplanning. It involved integrated soil fertility management of maize which combines the use of appropriate amounts of organic and inorganic fertilizers together with green manure and good agronomic practices. In addition, integrated water management was used with different irrigation levels and deficit irrigation as well as fixed partial root zone drying to increase efficiency of water management. The results showed that cattle manure can provide the available nutrients for plant growth water-holding properties, leading to increased productivity of maize. Also, green manure with common vetch can provide adequate amounts of nitrogen which is very important for maize. Therefore, efficient management of natural resources together with integrative crop management approaches can reduce inputs in crop plants and

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minimize the impact of agriculture on climate change. Adopted livestock management practices for cattle such as using locally produced feeds, close monitoring of animal health and timely veterinary interventions improved animal performance and productivity. In addition, it will be determined the greenhouse gas emission from all the treatments in order to reduce them. BIOCIRCULAR work continues towards an integrating system of smart farming and smart processing for optimal management of farms to minimize carbon footprint.

Keywords: bioeconomy; precision farming; smart farming; sustainability.

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