



ISPAMed

International Conference



Innovations for Sustainable Crop Production in the Mediterranean Region

Palermo 2024, July 11th and 12th

Department of Agricultural, Food and Forest Sciences
Main lecture hall "Gian Pietro Ballatore"
Viale delle Scienze, Edificio 4

Book of abstract

Book of Abstracts: Second Edition of the International Conference on Innovations for Sustainable Crop
Production in the Mediterranean Region

Editor: Giuseppe Di Miceli and Mario Licata

Second Edition 2024 - Palermo, Italy - www.ispamed.org

ISBN: 9791221055979

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Foreword

The Mediterranean region, with its rich cultural history and varied landscapes, represents a true treasure of biodiversity.

The agricultural sector plays a fundamental role, being the main source of food, forage, and raw materials for the production of textiles and biofuels for billions of people. However, increasing anthropogenic pressure and climate change present new environmental challenges to the sustainability of agriculture in this region. The agricultural sector holds significant potential to tackle these environmental issues by optimizing the impacts of its operations. With the aim of addressing these challenges in a collaborative and scientifically informed manner, the conference “Innovation for Sustainable Crop Production in the Mediterranean Region,” which will be held for the second consecutive year in the city of Palermo on July 11-12, 2024, will continue the discussions and dialogues initiated last year. This event represents an important moment of debate and knowledge exchange in the field of sustainable agricultural development, where the most current and relevant topics for industry professionals, scientists, students, and enthusiasts will be addressed, divided into five thematic areas.

Tiziano Caruso
Chair of the Scientific Committee

Giuseppe Di Miceli
Chair of the Organizational Committee

Conference programme

Thursday, 11 July 2024

8:30 Registration

9:30 Welcome, Opening and Addresses

- **Prof Massimo Midiri**, Rector University of Palermo
- **Prof Tiziano Caruso**, Head of the Department of Agricultural, Food and Forest Sciences, University of Palermo
- **Prof Leo Sabatino e Prof Giuseppe Di Miceli**, Conveners
- **Dr Dario Cartabellotta**, Director General of the Department of Agriculture, Sicily Region

10:00 **Session 1** - *Mediterranean Region: Biodiversity, Crop Productions, Livestock Systems and Environmental Sustainability*

Chair **Prof Tiziano Caruso**, Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy

Keynote lecture

Strategies to support crop productions and reduce GHG emissions in the Mediterranean area

Dr Leonardo Verdi, Department of Agriculture, Food, Environment and Forestry, University of Florence, Italy

Invited speaker

Physiological and biometeorological approaches for efficient irrigation management in California olive and pistachio orchards

Prof Giulia Marino, Department of Plant Sciences, University of California, Davis

Combining nitrogen fertilization and biostimulant application in durum wheat: effects on morphophysiological traits and grain production

Prof Roberto Ruggeri, Department of Agricultural and Forest Sciences, University of Tuscia, Italy

The impact of the Environmental, Social and Governance (ESG), companies report on the agriculture activity & sustainability

Prof José Rafael Marques da Silva, Instituto de Ciências Agrárias Mediterrânicas, Department of Rural Engineering, University of Évora, Portugal.

Functional agrobiodiversity: intercropping with legumes as the most promising tool for facilitating phosphorus availability in the Mediterranean cropping systems.

Dr Emilio Lo Presti, Department of Agriculture, University of Reggio Calabria, Italy

*Feeding responses and dairy production of ewes fed dehydrated sulla forage (*Sulla coronaria* (L.) Medik) as alternative to hay*

Dr Marialetizia Ponte, Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy

Comparison of olive oil consumers between Spain and Portugal

Prof Amparo Baviera-Puig, Polytechnic University of Valencia, Spain

13.00 Light lunch

14.30 **Session 2** - *Medicinal plants and industrial crops: towards sustainable management*

Chair **Prof Konstantinos A. Aliferis**, Department of Crop Science, Agricultural University of Athens, Greece

Keynote lecture

Sustainable management of medicinal and nutraceutical plants - a partnership for bioactive compound production?

Prof Ana Luisa Fernando, Universidade Nova de Lisboa, Portugal

Invited speaker

Intercropping systems with cardoon in mountainous Mediterranean regions: a case study from Sardinia

Prof Vittoria Giannini, Department of Agronomy Food Natural resources Animals and Environment, University of Padova, Italy

Medicinal and Aromatic Plants Cultivation and Processing in Türkiye

Prof Nazim Şekeroğlu, Department of Biology, Gaziantep University, Gaziantep, Turkey

Brassicas in the Mediterranean Basin: more opportunities than problems

Dr Roberto Matteo, Research Centre for Cereal and Industrial Crops, Bologna, Italy

Effects of sustainable agronomic management in giant reed for biomethane production

Dr Alessandra Piccitto, Department of Agriculture, Food and Environment, University of Catania, Italy

*Digestate, cover crops and soil tillage management: preliminary results on soil fertility and on mais (*Zea mais* L.) crops*

Dr Enrica Allevato, Department of Environmental and Prevention Sciences, University of Ferrara, Italy

Rapid measurement and statistical ranking of leaf drought tolerance capacity in cotton

Prof Xuejun Dong, Department of Soil and Crop Sciences, Texas A&M University, United States

17.00 Short presentation

Chair **Prof Albino Maggio**, Department of Agricultural Sciences, University of Napoli, Italy

Effect of biostimulants foliar application on yield, essential oil and chemical properties of organically grown sage

Dr Davide Farruggia, Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy

*Expression of plant-environment interaction of four groups of *Vicia faba* selected from a mixed population*

Dr Antonella Iurato, Department of Agriculture, Food and Environment, University of Catania, Italy

Assessing the environmental impact of durum wheat in Sicily, Italy: a comparison between conventional and organic systems

Dr Monica Auteri, Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy

Joint Action of Trichoderma atroviride and a Vegetal Derived-Protein Hydrolysate Improves Yield, Fruit Quality of Two Woodland Strawberry Cultivars Grown Under Greenhouse

Dr Pietro Bellitto, Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy

RIUBSAL: opportunities for expanding the use of reclaimed water for olive tree irrigation

Dr Francesco Abbatantuono, Department of Soil, Plant and Food Science, University of Bari Aldo Moro, Italy

Molybdenum biofortification as eustress factor through arbuscular mycorrhizal fungi application in a cherry tomato soilless system

Dr Lorena Vultaggio, Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy

Trend of research on durum wheat irrigation by bibliographic mapping

Dr Noemi Tortorici, Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy

Vegetation Analysis and Productivity Assessment of Natural Pastures in Madonie Regional Park, Sicily

Dr Nicoletta Lala, Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy

Differential physiological activity and metabolomic signatures of lettuce plants grown under nitrogen deficiency conditions and treated with different vegetal derived biostimulants

Dr Christophe El Nakhel, Department of Agricultural Sciences, University of Naples Federico II, Italy

Effects of pasture supplemented with Aloe Vera on lamb meat production: preliminary results

Dr Simona Prestigiacomo, Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy

Effects of biostimulants and corroborants on plant pathogenic fungi

Dr Marika Lamendola, Department of Agricultural, Food and Forest Sciences (SAAF), University of Palermo, Italy

Evaluation of Olive Oil Polyphenols' Properties on Ex Vivo Models: Results from Preliminary Studies

Dr Anna Calabrò, Department of Biomedicine, Neurosciences and Advanced Diagnostics, University of Palermo, Italy

20:00 Inauguration of the Santa Rosalia exhibition presso "Villa Niscemi", piazza Niscemi, Palermo and **conference dinner**.

Friday, 12 July 2024

9:00 **Session 3** – Food and health: how the research of well-being passes through the agri-food production system

Chair **Prof Giuseppina Candore**, Department of Biomedicine, Neurosciences and Advanced Diagnostics, University of Palermo, Italy

Keynote lecture

The importance of Diet in Health: What About the Future?

Prof Antonio Garcia Rios, Department of Internal Medicine, Maimonides Biomedical Research Institute of Cordoba (IMIBIC), University of Cordoba, Spain

Invited speaker

Functional foods for healthy aging

Dr Giulia Accardi, Department of Biomedicine, Neurosciences and Advanced Diagnostics, University of Palermo, Italy

The Nutraceutical Properties of Rhus coriaria Linn: Potential Application on Human Health and Aging Biomedicine

Dr Anna Aiello, Department of Biomedicine, Neurosciences and Advanced Diagnostics, University of Palermo, Italy

Nutraceuticals and healthy aging, implications for a positive nutrition

Prof Giovanni Scapagnini, Department of Medicine and Health Sciences "V. Tiberio", University of Molise, Italy

Non-Celiac Wheat Sensitivity: a new challenge for cereal growers

Dr Aurelio Seidita, Department of Health Promotion Sciences, Maternal and Infant Care, Internal Medicine and Medical Specialties, University of Palermo, Italy

Nutrition, epigenetic modulation and healthy ageing

Prof Giuseppe Passarino, Department of Biology, Ecology and Earth Sciences, University of Calabria, Italy

11:30 **Session 4 - Entomology and Pathology: pesticide which scenario for the next future in a contest of the new European Green Deal?**

Chair **Dr Slavica Matic**, Institute for Sustainable Plant Protection, National Research Council, Turin, Italy

Keynote lecture

Plant protection products in EU: too many or too few? A look to fungicides and related alternatives

Prof Gianfranco Romanazzi, Department of Agricultural, Food and Environmental Sciences, Marche Polytechnic University, Ancona, Italy

Invited speaker

Sustainable strategies to improve resilience to fungal diseases in berry crops

Prof Tânia R. Fernandes, Sustainable Agrifood Production Research Centre, University of Porto, Portugal

How to manage plant disease risk when implanting a new crop as sugarcane in a Mediterranean European environment

Prof Jean Heinrich Daugrois, Department Bios, Research unit Plant Health Institute

Montpellier, CIRAD, France

Coming of age: metabolomics in biostimulant research and development to combat the climate crisis and secure food supply

Prof Konstantinos A. Aliferis, Department of Crop Science, Agricultural University of Athens, Greece

Honeydew management to promote biological control

Dr Maite Fernández de Bobadilla, Centro de Protección Vegetal y Biotecnología, Instituto Valenciano de Investigaciones Agrarias, Spain

Chemical and visual cues in host-plant selection of the melon ladybird: new perspectives in biological control

Dr Valerio Saitta, Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy

14:00 Light Lunch

15:00 **Session 5** – *Innovative approaches for agricultural water management in a climate change*

Chair **Prof Giorgio Micale**, Department of Engineering, University of Palermo, Italy

Keynote lecture

Experimental investigation of the performance of a seawater reverse osmosis desalination system operating under variable feed flowrate pressure and temperature

Prof George Papadakis, School of Environment and Agricultural Engineering, Agricultural University of Athens, Athens, Greece

Invited speaker

Constructed wetlands as nature-based solution for sustainable wastewater treatment and reuse for agriculture: a critical assessment by experimental studies and literature

Prof Mario Licata, Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy.

Improving irrigation efficiency by using sensors to monitor the soil-plant-atmosphere system

Dr Vincenzo Alagna, Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy

Use of remote sensing and modelling for crop and water monitoring in mediterranean area

Dr Dominique Courault, UMR 1114 EMMAH, INRAE, Avignon, France

Biostimulants, N level and drought stress intensity synergistically orchestrate yield, quality and physiology of greenhouse-grown basil

Dr Beppe Benedetto Consentino, Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy.

Risk perception and the water crisis: a geographical approach

Prof Gaetano Sabato, Department of Psychology, Educational Science and Human Movement, University of Palermo, Italy.

Continuous monitoring of tree water potential in olive for efficient irrigation management

Prof Paula Guzman Delgado, Department of Plant Sciences, University of California, Davis

Regulated deficit irrigation to boost processing tomato sustainability in Mediterranean environment

Dr Nicolo Iacuzzi, Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy.

17.00 Short presentation

Chair **Dr Giovanni Gugliuzza**, Research Centre for Plant Protection and Certification, Italy

Climate change, water scarcity and adaptation strategies in Sicily

Dr Antonino Drago, Department Agriculture Sicily Region, Italy

Medicago intertexta as a forage crop: exploring various utilizations in the Mediterranean environment

Dr Lucia Dinolfo, Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy

Saffron “the red gold spice”: how to improve its profitability

Dr Cinzia Barbieri, Department of Agricultural, Forest and Food Sciences, University of Torino, Italy

Agronomic evaluation of 13 cotton varieties to organic cultivation in a hot arid environment

Dr Federica Alaimo, Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy

*Morphometric and agronomic traits multivariate analysis of sumac (*Rhus coriaria* L.) grown wild in Eastern Sicily*

Dr Valentina Formica, Department of Agriculture, Food, and Environment, University of Catania, Italy

*Comprehensive Protein-Protein Interaction Network Analysis of *Xylella fastidiosa* in Fruit Tree Crops*

Dr Aparna S. Balan, Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy

A Decade-Long Quantitative and Qualitative Characterization of 18 Lemon Cultivars

Dr Aurora Cirillo, Department of Agricultural Sciences, University of Naples Federico II, Naples, Italy

Composting sewage sludge with biochar and zeolite: effect on composting process and soil-sunflower system

Dr Sara Paliaga, Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy

*Can the combination of two apulian traditional agri-food products generate a superfood? The case of functional taralli with *Pleurotus eryngii**

Dr Fortunato Cirilincione, Department of Soil, Plant and Food Sciences, University of Bari Aldo Moro, Italy

*First report of *Sargassum muticum* in *Caretta caretta*, Sicily, Italy.*

Dr Rosalia Disclafani, Sustainability and Ecological Transition Center, University of Palermo, Italy

Impact of saline groundwater irrigation on net assimilation in Cucumis melo cv. Huanghemi in north-western China

Dr Miriam Distefano, Institute of BioEconomy (IBE), National Research Council of Italy (CNR), Catania, Italy

The potential role of hormone-related genes in controlling the olive dwarf phenotype observed in the F2 progeny of 'Koroneiki'

Prof Annalisa Marchese, Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy

The spearmint sector: a niche activity with strong development potential in Morocco

Dr Kawtar Mahrach, Department of Food and Nutritional Sciences, HASSAN II Agronomic and Veterinary Institute, Rabat, Morocco

Overview on the global spice and herbs market with a focus on Morocco's position

Dr Fatima Zahraa Lahsaini, Department of Food Science and Nutrition, Hassan II Institute of Agronomy and Veterinary Medicine, Rabat, Morocco.

19:30 *Closing of the Conference and Final Conclusions*

Dr Roberto Massenti e Prof Giuseppe Di Miceli, Conveners

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Assessing the Environmental Impact of Durum Wheat in Sicily, Italy: A Comparison Between Conventional and Organic Systems

Monica Auteri^a, Giuseppe Di Miceli^a, Mario Licata^a, Rose Mankaa^b, Simona Prestigiacomo^a, Marzia Traverso^b

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Wheat production is one of the most important agricultural systems, with an estimated global area of about 219 million hectares. It has been shown that agricultural systems and the cereal industry as part of this, may potentially threaten biodiversity and ecosystem functions. This highlights the necessity to optimise the production of wheat grain in an environmentally sustainable way. The aim of this study was to evaluate and compare the environmental impacts of conventional and organic wheat grain production systems in Sicily using the Life Cycle Assessment (LCA) method. The analysis was conducted using data from 21 farms (14 conventional and 7 organic) based in Sicily in 2021 and 2022. A "cradle to gate" system boundary was specified. All wheat cultivation activities were considered. In this study, yield (t ha^{-1}) was used as the functional unit (FU). In the life cycle inventory stage, primary data was collected through questionnaires. Secondary data from Ecoinvent v.3.0 was used in instances where the necessary primary information was unavailable. The analysis was carried out using SimaPro 9.5.0.1. The CML-IA baseline impact assessment method was used, considering 11 categories. The results showed that for almost all impact categories, conventional farming had higher environmental impacts than organic farming. Normalized results suggested that, for both systems, marine aquatic ecotoxicity was the most affected impact category, with calculated values ranging from $1,30\text{E}+05$ to $1,05\text{E}+06 \text{ kg 1,4-DB eq.}$

For the conventional system, most of the impact categories were mainly influenced by transport of all products and by pesticide production, especially for ozone layer depletion and abiotic depletion. The only exception was terrestrial ecotoxicity, which was mainly affected by seed production. Only eutrophication was primarily affected by the cultivation step. The production of packaging, lubricating oil and waste treatments had no significant impact. In organic system, in almost all categories, the most significant impacts were related to the production and use of diesel. Furthermore, there were no differences between self-produced seeds vs. seeds that were sourced from local producers. The findings of this study are useful in assessing solutions to reduce the environmental impacts related to wheat production.

Funding: This abstract is part of the project NODES which has received funding from the MUR - M4C2 1.5 of PNRR funded by the European Union - NextGenerationEU (Grant agreement no. ECS00000036).