

BOOK OF ABSTRACTS



*XIV International Scientific Agriculture Symposium
"Agrosym 2023"
Jahorina, October 05-08, 2023*



BOOK OF ABSTRACTS

**XIV International Scientific Agriculture Symposium
“AGROSYM 2023”**



Jahorina, October 05 - 08, 2023

Impressum

XIV International Scientific Agriculture Symposium „AGROSYM 2023“

Book of Abstracts Published by

University of East Sarajevo, Faculty of Agriculture, Republic of Srpska, Bosnia
University of Belgrade, Faculty of Agriculture, Serbia
Mediterranean Agronomic Institute of Bari (CIHEAM - IAMB) Italy

International Society of Environment and Rural Development, Japan
Balkan Environmental Association (B.EN.A), Greece
Centre for Development Research, University of Natural Resources and Life Sciences
(BOKU), Austria
Perm State Agro-Technological University, Russia
Voronezh State Agricultural University named after Peter The Great, Russia
Tokyo University of Agriculture
Shinshu University, Japan
Faculty of Agriculture, University of Western Macedonia, Greece
Enterprise Europe Network (EEN)
Faculty of Agriculture, University of Akdeniz - Antalya, Turkey
Selçuk University, Turkey

University of Agronomic Sciences and Veterinary Medicine of Bucharest, Romania
Slovak University of Agriculture in Nitra, Slovakia
Ukrainian Institute for Plant Variety Examination, Kyiv, Ukraine
National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine
Valahia University of Targoviste, Romania
National Scientific Center „Institute of Agriculture of NAAS“, Kyiv, Ukraine
Saint Petersburg State Forest Technical University, Russia
University of Valencia, Spain
Faculty of Agriculture, Cairo University, Egypt
Tarbiat Modares University, Iran
Chapingo Autonomous University, Mexico

Department of Agricultural, Food and Environmental Sciences, University of Perugia, Italy
Higher Institute of Agronomy, Chott Mariem-Sousse, Tunisia
Watershed Management Society of Iran
Institute of Animal Science- Kostinbrod, Bulgaria
SEASN- South Eastern Advisory Service Network, Croatia
Faculty of Economics Brcko, University of East Sarajevo, Bosnia and Herzegovina
Biotechnical Faculty, University of Montenegro, Montenegro
Institute of Field and Vegetable Crops, Serbia
Institute of Lowland Forestry and Environment, Serbia
Institute for Science Application in Agriculture, Serbia
Agricultural Institute of Republic of Srpska - Banja Luka, Bosnia and Herzegovina
Maize Research Institute “Zemun Polje”, Serbia
Faculty of Agriculture, University of Novi Sad, Serbia
Institute for Animal Science, Ss. Cyril and Methodius University in Skopje, Macedonia
Academy of Engineering Sciences of Serbia, Serbia
Balkan Scientific Association of Agricultural Economics, Serbia
Institute of Agricultural Economics, Serbia

Editor in Chief

Dusan Kovacevic

Technical editors

Sinisa Berjan
Milan Jugovic
Rosanna Quagliariello

Website:

<http://agrosym.ues.rs.ba>

CIP - Каталогизација у публикацији
Народна и универзитетска библиотека
Републике Српске, Бања Лука

631(048.3)(0.034.4)

INTERNATIONAL Scientific Agricultural Symposium "Agrosym
2023" (14 ; Jahorina)

Book of Abstracts [Електронски извор] / XIV International
Scientific Agriculture Symposium "Agrosym 2023", Jahorina,
October 05 - 08, 2023 ; [editor in chief Dušan Kovačević]. - East
Sarajevo =Istočno Sarajevo : Faculty of Agriculture =Poljoprivredni
fakultet, 2023. - 1 електронски оптички диск (CD-ROM) : текст,
слика ; 12 cm

Системски захтеви: Нису наведени. - Насл. са насл. екрана. -
Регистар.

ISBN 978-99976-987-7-3

COBISS.RS-ID 139166465

**XIV International Scientific Agricultural Symposium “Agrosym 2023”
Jahorina, October 05-08, 2023, Bosnia and Herzegovina**

HONORARY COMMITTEE

- Mr. Savo Minic**, Minister of Agriculture, Water Management and Forestry of Republic of Srpska, Bosnia and Herzegovina
Dr. Zeljko Budimir, Minister of Scientific-Technological Development, Higher Education and Information Society of Republic of Srpska, Bosnia and Herzegovina
Prof. dr Mario T. Tabucanon, President of the International Society of Environment and Rural Development, Japan
Prof. dr Milan Kulic, Rector of the University of East Sarajevo, Bosnia and Herzegovina
Prof. dr Dusan Zivkovic, Dean of the Faculty of Agriculture, University of Belgrade, Serbia
Dr. Maurizio Raeli, Director of the Mediterranean Agronomic Institute of Bari, Italy
Prof. dr Metin Aksoy, Rector of the Selcuk University, Turkey
Prof. dr Aleksey Andreev, Rector of the Perm State Agro-Technological University, Russia
Prof. dr Alexey Yu. Popov, Rector of the Voronezh State Agricultural University named after Peter The Great, Russia
Prof. dr Barbara Hinterstoisser, Vice-Rector of the University of Natural Resources and Life Sciences (BOKU), Austria
Prof. dr Sorin Mihai Cimpeanu, Rector of the University of Agronomic Sciences and Veterinary Medicine of Bucharest, Romania
Doc. Ing. Klaudia Halászová, Rector of the Slovak University of Agriculture in Nitra, Slovakia
Prof. dr Calin D. Oros, Rector of the Valahia University of Targoviste, Romania
Prof. Dr Katerina Melfou, Dean of the Faculty of Agriculture, University of Western Macedonia, Greece
Prof. dr Amr Ahmed Mostafa, Dean of the Faculty of Agriculture, Cairo University, Egypt
Prof. dr José Sergio Barrales Domínguez, Rector of the Chapingo Autonomous University, Mexico
Prof. dr Davut Karayel, Dean of Faculty of Agriculture, University of Akdeniz - Antalya, Turkey
Prof. Dr EGUCHI Fumio, Rector of the Tokyo University of Agriculture, Japan
Prof Dr Sait Gezgin, Dean of Faculty of Agriculture, University of Selçuk- Konya, Turkey
Dr Chokri Thabet, the General Director of the High Agronomic Institute of Chott Mariem, Sousse, Tunisia
Prof. dr Ivan Yanchev, Director of the Institute of Animal Science- Kostinbrod, Bulgaria
Prof. dr Seyed Hamidreza Sadeghi, Professor at Tarbiat Modares University and the President of the Watershed Management Society of Iran, Iran
Prof. dr Francesco Tei, Director of the Department of Agricultural, Food and Environmental Sciences, University of Perugia, Italy
Prof. dr Viktor Kaminskyi, Director of National Scientific Center „Institute of Agriculture of NAAS“, Kyiv, Ukraine
Dr. Igor Hrovatič, President of South Eastern Advisory Service Network, Croatia
Prof. dr Mirza Dautbasic, Dean of the Faculty of Forestry, University of Sarajevo, Bosnia and Herzegovina
Prof. dr Bozidarka Markovic, Dean of the Biotechnical Faculty, University of Podgorica, Montenegro
Prof. dr Rade Jovanovic, Director of the Institute for Science Application in Agriculture, Serbia
Prof. dr Lazar Radovanovic, Dean of the Faculty of Economics Brcko, University of East Sarajevo, Bosnia and Herzegovina
Prof. dr Vojislav Trkulja, Director of Agricultural Institute of Republic of Srpska - Banja Luka, Bosnia and Herzegovina
Dr. Miodrag Tolimir, Director of the Maize Research Institute “Zemun Polje”, Serbia
Prof. Dr. Jegor Miladinović, Director of the Institute of Field and Vegetable Crops, Serbia
Prof. dr Nedeljko Tica, Dean of the Faculty of Agriculture, University of Novi Sad, Serbia
Prof. dr Rodne Nastova, Director of the Institute for Animal Science, Skoplje, Macedonia
Prof. dr Sasa Orlovic, Director of the Institute of Lowland Forestry and Environment, Serbia
Prof. dr Jonel Subic, Director of the Institute of Agricultural Economics, Serbia
Prof. dr Branko Kovacevic, President of the Academy of Engineering Sciences of Serbia, Serbia
Prof. dr Radovan Pejanovic, President of Balkan Scientific Association of Agricultural Economics, Serbia

SCIENTIFIC COMMITTEE

- Chairman: Academician Prof. dr Dusan Kovacevic**, Faculty of Agriculture, University of Belgrade, Serbia
Prof. dr Machito Mihara, Tokyo University of Agriculture, Japan
Prof. dr John Brayden, Norwegian Agricultural Economics Research Institute (NILF), Norway
Prof. dr Steve Quarie, Visiting Professor, School of Biology, Newcastle University, United Kingdom
Prof. dr Andreas Melcher, CDR, University of Natural Resources and Life Sciences (BOKU), Vienna, Austria
Prof. dr Dieter Trautz, University of Applied Science, Germany

Prof. dr Sergei Eliseev, Vice-Rector for Research and Innovations, Perm State Agro-Technological University, Russia
Prof. dr Dani Shtienberg, full professor, Department of Plant pathology and Weed Research, ARO, the Volcani Center, Bet Dagan, Israel
Prof. dr William Meyers, Howard Cowden Professor of Agricultural and Applied Economics, University of Missouri, USA
Prof. dr Markus Schermer, Department of Sociology, University of Innsbruck, Austria
Prof. dr Thomas G. Johnson, University of Missouri – Columbia, USA
Prof. dr Fokion Papathanasiou, School of Agricultural Sciences, University of Western Macedonia, Greece
Prof. dr Sabahudin Bajramovic, Faculty of Agriculture and Food Sciences, University of Sarajevo, Bosnia and Herzegovina
Prof. dr Hiromu Okazawa, Faculty of Regional Environment Science, Tokyo University of Agriculture, Japan
Prof. dr Tatiana Sivkova, Faculty for Veterinarian Medicine and Zootechny, Perm State Agro-Technological University, Russia
Prof. dr Aleksej Lukin, Voronezh State Agricultural University named after Peter The Great, Russia
Prof. dr Matteo Vittuari, Faculty of Agriculture, University of Bologna, Italy
Prof. dr Seyed Mohsen Hosseini, Faculty of Natural Resources, Tarbiat Modares University, Iran
Prof. dr Ardian Maci, Faculty of Agriculture and Environment, Agricultural University of Tirana, Albania
Prof. dr Regucivilla A. Pobar, Bohol Island State University, Philippines
Prof. dr Sudheer Kundukulangara Pulissery, Kerala Agricultural University, India
Prof. dr EPN Udayakumara, Faculty of Applied Sciences, Sabaragamuwa University, Sri Lanka
Prof. dr Vladimir Smutný, full professor, Mendel University, Faculty of agronomy, Czech Republic
Prof. dr Franc Bavec, full professor, Faculty of Agriculture and Life Sciences, Maribor, Slovenia
Prof. dr Jan Moudrý, full professor, Faculty of Agriculture, South Bohemia University, Czech Republic
Prof. dr Stefan Tyr, full professor, Faculty of Agro-biology and Food Resources, Slovakia
Prof. dr Natalija Bogdanov, Faculty of Agriculture, University of Belgrade, Serbia
Prof. dr Richard Barichello, Faculty of Land and Food Systems, University of British Columbia, Canada
Prof. dr Francesco Porcelli, University of Bari Aldo Moro, Italy
Prof. dr Vasilije Isajev, Faculty of Forestry, University of Belgrade, Serbia
Prof. dr Elazar Fallik, Agricultural Research Organization (ARO), Volcani, Israel
Prof. dr Junaid Alam Memon, Pakistan Institute of Development Economics, Pakistan
Prof. dr Jorge Batlle-Sales, Department of Biology, University of Valencia, Spain
Prof. dr Pandi Zdruli, Land and Water Resources Department; IAMB, Italy
Prof. dr Mladen Todorovic, Land and Water Resources Department; IAMB, Italy
Dr. Hamid El Bilali, Mediterranean Agronomic Institute of Bari, Italy
Prof. dr Maksym Melnychuk, National Academy of Agricultural Science of Ukraine, Ukraine
Prof. dr Borys Sorochnytskyi, Ukrainian Institute for Plant Variety Examination, Kyiv, Ukraine
Dr. Lorenz Probst, CDR, University of Natural Resources and Life Sciences (BOKU), Vienna, Austria
Prof. dr Dragana Sunjka, Faculty of Agriculture, University of Novi Sad, Serbia
Prof. dr Miodrag Dimitrijevic, Faculty of Agriculture, University of Novi Sad, Serbia
Prof. dr Mohsen Boubaker, High Institute of Agronomy of Chott Meriem, Sousse, Tunisia
Dr. Nouredin Driouech, Coordinator of MAIB Alumni Network (FTN), Mediterranean Agronomic Institute of Bari, Italy
Prof. dr Ion Viorel, University of Agronomic Sciences and Veterinary Medicine of Bucharest, Romania
Prof. dr. Chuleemas Boonthai Iwai, Faculty of Agriculture, Khon Kaen University, Thailand
Prof. dr Wathuge T.P.S.K. Senarath, Department of Botany, University of Sri Jayewardenepura, Colombo, Sri Lanka
Dr. Hamada Abdelrahman, Soil Science Dept., Faculty of Agriculture, Cairo University, Egypt
Prof. dr Maya Ignatova, Agricultural Academy – Sofia, Bulgaria
Prof. dr Ioannis N. Xynias, School of Agricultural Technology & Food Technology and Nutrition, Western Macedonia University of Applied Sciences, Greece
PhD ing. Artur Rutkiewicz, Department of Forest Protection, Forest Research Institute - IBL, Poland
Prof. dr Mohammad Sadegh Allahyari, Islamic Azad University, Rasht Branch, Iran
Dr. Lalita Siri wattananon, Faculty of Agricultural Technology, Rajamangala University of Technology Thanyaburi (RMUTT), Thailand
Prof. dr Konstantin Korlyakov, Perm Agricultural Research Institute, Russia
Dr. Mohammad Farooque Hassan, Shaheed Benazir Bhutto University of Veterinary & Animal Sciences Sakrand, Sindh, Pakistan
Dr. Larysa Prysiashniuk, Ukrainian Institute for Plant Variety Examination, Kyiv, Ukraine
Prof. dr Oksana Kliachenko, National University of Life and Environmental Science of Ukraine, Ukraine
Prof. dr Ivan Simunic, Department of amelioration, Faculty of agriculture, University of Zagreb, Croatia
Dr. Abid Hussain, International Centre for Integrated Mountain Development (ICIMOD), Nepal
Dr. Amrita Ghatak, Gujarat Institute of Development Research (GIDR), India
Prof. dr Naser Sabaghnia, University of Maragheh, Iran

Dr. Karol Wajszczuk, Poznan University of Life Sciences, Poland
Prof. dr Penka Moneva, Institute of Animal Science - Kostinbrod, Bulgaria
Prof. dr Mostafa K. Nassar, Animal husbandry Dept., Faculty of Agriculture, Cairo University, Egypt
Prof. dr Márta Birkás, full professor, St. Istvan University, Godollo - Hungary
Prof. dr Andrzej Kowalski, Director of the Institute for Agricultural and Food Economy, Warszawa-Poland
Prof. dr Yalcin Kaya, The Director of the Plant Breeding Research Center, University of Trakya, Turkey
Prof. dr Sanja Radonjic, Biotechnical Faculty, University of Montenegro, Montenegro
Prof. dr Ionela Dobrin, Department for Plant Protection, University of Agronomic Sciences and Veterinary Medicine of Bucharest, Romania
Prof. dr Inocencio Buot Jr., Institute of Biological Sciences, College of Arts and Sciences, University of the Philippines Los Banos, Philippines
Prof. dr Monica Paula Marin, Department for Animal Husbandry, University of Agronomic Sciences and Veterinary Medicine of Bucharest, Romania
Prof. dr Nedeljka Nikolova, Institute for Animal Science, Ss. Cyril and Methodius University in Skopje, Republic of Macedonia
Prof. dr Mohammad Al-Mamun, Department of Animal Nutrition, Bangladesh Agricultural University, Bangladesh
Prof. dr Anucha Wittayakorn-Puripunpinyoo, School of Agriculture and Co-operatives, Sukhothai Thammathirat Open University, Nonthaburi, Thailand
Dr. Redouane Choukr-Allah, International Center for Biosaline Agriculture (ICBA), United Arab Emirates
Prof. dr Ignacio J. Díaz-Maroto, High School Polytechnic, University of Santiago de Compostela, Spain
Prof. dr Nidal Shaban, University of Forestry Sofia, Bulgaria
Prof. dr Mehdi Shafaghati, Faculty of Geography, Tarbiat Moalem (kharazmi) University, Iran
Prof. dr Youssif Sassine, Lebanese University Beirut, Lebanon
Prof. dr Cafer Topaloglu, Faculty of Tourism, Mugla Sitki Kocman University, Turkey
Prof. dr Seyed Hamidreza Sadeghi, Faculty of Natural Resources, Tarbiat Modares University, Iran
Prof. dr Mohsen Mohseni Saravi, University of Teheran and Member of WMSI Management Board, Iran
Prof. dr Branislav Draskovic, Faculty of Agriculture, University of East Sarajevo, Bosnia and Herzegovina
Prof. dr Mahmood Arabkhedri, Soil Conservation and Watershed Management Research Institute and Member of WMSI Management Board, Iran
Prof. dr Ataollah Kavian, Sari Agricultural Science and Natural Resources University and Member of WMSI Management Board, Iran
Prof. dr Tugay Ayasan, Department of Organic Farming Business Management, Osmaniye, Applied Science School of Kadirli, Osmaniye Korkut Ata University, Turkey
Prof. dr Sakine Özpınar, Department of Farm Machinery and Technologies Engineering, Faculty of Agriculture, Çanakkale Onsekiz Mart University, Çanakkale, Turkey
Prof. dr Sherein Saeide Abdelgayed, Faculty of Veterinary Medicine, Cairo University, Cairo, Egypt
Prof. dr Zohreh Mashak, Islamic Azad University, Karaj Branch, Iran
Dr. Khalid Azim, National Institute of Agriculture Research, Morocco
Dr. Mario Licata, Department of Agricultural, Food and Forest Sciences, University of Palermo, Italy
Prof. dr Srdjan Lalic, University of East Sarajevo, Bosnia and Herzegovina
Prof. dr Muhammad Ovais Omer, Faculty of Bio-Sciences, University of Veterinary & Animal Sciences, Lahore, Pakistan
Dr. Edouard Musabanganji, School of Economics/CBE, University of Rwanda, Rwanda
Prof. dr Kubilay Baştaş, Department of Plant Protection, Faculty of Agriculture, Selçuk University, Turkey
Dr. Branka Kresovic, Director of the Maize Research Institute “Zemun Polje”, Serbia
Dr. Nenad Delic, Maize Research Institute “Zemun Polje”, Serbia
Dr. Milan Stevanovic, Maize Research Institute “Zemun Polje”, Serbia
Prof. Violeta Babic, Faculty of Forestry, University of Belgrade, Serbia
Dr. Svetlana Balesevic-Tubic, Institute of Field and Vegetable Crops Novi Sad, Serbia
Dr. Ana Marjanovic Jeromela, Institute of Field and Vegetable Crops Novi Sad, Serbia
Prof. dr Tatjana Krajisnik, Faculty of Agriculture, University of East Sarajevo, Bosnia and Herzegovina
Prof. dr Aleksandra Govedarica-Lucic, Faculty of Agriculture, University of East Sarajevo, Bosnia and Herzegovina
Prof. dr Desimir Knezevic, University of Pristina, Faculty of Agriculture, Kosovska Mitrovica - Lesak, Kosovo i Metohija, Serbia
Dr. Snezana Mladenovic-Drinic, Maize Research Institute “Zemun Polje”, Serbia
Prof. dr Nebojsa Momirovic, Faculty of Agriculture, University of Belgrade, Serbia
Prof. dr Osman Mujezinovic, Faculty of Forestry, University of Sarajevo, Bosnia and Herzegovina
Prof. dr Dalibor Ballian, Faculty of Forestry, University of Sarajevo, Bosnia and Herzegovina
Prof. dr Zoran Jovovic, Biotechnical Faculty, University of Montenegro, Montenegro
Prof. dr Danijel Jug, Faculty of Agriculture, University of Osijek, Croatia
Prof. dr Milan Markovic, Biotechnical Faculty, University of Montenegro, Montenegro
Prof. dr Zeljko Dolijanovic, Faculty of Agriculture, University of Belgrade, Serbia

Prof. Mirjana Jovovic, Faculty of Agriculture, University of East Sarajevo, Bosnia and Herzegovina
Prof. Goran Marinkovic, Faculty of Technical Sciences, University of Novi Sad, Serbia
Dr Dejan Stojanovic, Institute of Lowland Forestry and Environment, Serbia
Dr Dobrivoj Postic, Institute for plant protection and environment, Belgrade, Serbia
Dr Srdjan Stojnic, Institute of Lowland Forestry and Environment, Serbia
Dunja Demirović Bajrami, Research Associate, Geographical Institute “Jovan Cvijić,” Serbian Academy of Sciences and Arts, Belgrade, Serbia

ORGANIZING COMMITTEE

Chairperson: Prof. dr Vesna Milic, Dean of the Faculty of Agriculture, University of East Sarajevo, Bosnia and Herzegovina
Dr Marko Gutalj, Vice rector of the University of East Sarajevo, Bosnia and Herzegovina
Dr Jelena Kronic, Vice rector of the University of East Sarajevo, Bosnia and Herzegovina
Dr. Maroun El Moujabber, Mediterranean Agronomic Institute of Bari, Italy
Mrs. Rosanna Quagliariello, Mediterranean Agronomic Institute of Bari, Italy
Dr. Nouredin Driouech, Coordinator of MAIB Alumni Network (FTN), Mediterranean Agronomic Institute of Bari, Italy
Dr Milic Curovic, The journal “Agriculture and Forestry”, Biotechnical Faculty Podgorica, University of Montenegro, Montenegro
Dr. Tatiana Lysak, International Relations Office, Voronezh State Agricultural University named after Peter The Great, Russia
Dr. Oksana Fotina, International Relations Center, Perm State Agro-Technological University, Russia
Prof. dr Fokion Papathanasiou, School of Agricultural Sciences, University of Western Macedonia, Greece
Dr Ana Marjanović Jeromela, Institute of Field and Vegetable Crops, Serbia
Dr. Anastasija Novikova, Faculty of Bioeconomy Development, Vytautas Magnus University, Lithuania
Prof. dr Engr. Teodora Popova, Institute of Animal Science - Kostinbrod, Bulgaria
Prof. dr Mehmet Musa Ozcan, Faculty of Agriculture, Selçuk University, Turkey
Dr. Abdulvahed Khaledi Darvishan, Faculty of Natural Resources, Tarbiat Modares University, Iran
Prof. dr Nikola Pacinovski, Institute for Animal Science, Ss. Cyril and Methodius University in Skopje, N. Macedonia
MSc. Erasmo Velázquez Cigarroa, Department of Rural Sociology, Chapingo Autonomous University, Mexico
Dr. Ecaterina Stefan, University of Agronomic Sciences and Veterinary Medicine of Bucharest, Romania
Dr. Jeeranuch Sakkhamduang, The International Society of Environmental and Rural Development, Japan
Dr. Raoudha Khanfir Ben Jenana, High Institute of Agronomy of Chott Meriem, Sousse, Tunisia
Dr. Hamada Abdelrahman, Soil Science Dept., Faculty of Agriculture, Cairo University, Egypt
Prof. Dragana Sunjka, Faculty of Agriculture, University of Novi Sad, Serbia
Dr. Antonije Zunic, Faculty of Agriculture, University of Novi Sad, Serbia
Dr. Vedran Tomic, Institute for Science Application in Agriculture, Serbia
MSc. Vojin Cvijanovic, Institute for Science Application in Agriculture, Serbia
MSc. Mladen Petrovic, Institute for Science Application in Agriculture, Serbia
Dr. Milan Stevanovic, Maize Research Institute “Zemun Polje”, Serbia
Dr. Andrej Pilipovic, Institute of Lowland Forestry and Environment, Serbia
Dr. Sc. Morteza Behzadfar, Tarbiat Modares University, Tehran, Iran
Dr. Larysa Prysiazhniuk, Ukrainian Institute for Plant Variety Examination, Kyiv, Ukraine
Doc. dr Sead Ivojevic, Faculty of Forestry, University of Sarajevo, Bosnia and Herzegovina
Dr. Nenad Markovic, Enterprise E. N. (EEN) Coordinator, University of East Sarajevo, Bosnia and Herzegovina
Domagoj Group, SEASN - South Eastern Advisory Service Network, Croatia
Prof. dr Zeljko Lakic, Agricultural Institute of Republic of Srpska - Banja Luka, Bosnia and Herzegovina
Doc. dr Zoran Maletic, Faculty of Agriculture, University of East Sarajevo, Bosnia and Herzegovina
MSc. Milan Jugovic, Faculty of Agriculture, University of East Sarajevo, Bosnia and Herzegovina
Prof. dr Sinisa Berjan, Faculty of Agriculture, University of East Sarajevo, Bosnia and Herzegovina
MSc. Milena Stankovic, Faculty of Agriculture, University of East Sarajevo, Bosnia and Herzegovina
Dr. Stefan Stjepanovic, Faculty of Agriculture, University of East Sarajevo, Bosnia and Herzegovina
MSc. Stefan Bojic, Faculty of Agriculture, University of East Sarajevo, Bosnia and Herzegovina
Dr. Tanja Jakisic, Faculty of Agriculture, University of East Sarajevo, Bosnia and Herzegovina
Dr. Boban Miletic, Faculty of Agriculture, University of East Sarajevo, Bosnia and Herzegovina
MSc. Todor Djorem, Faculty of Agriculture, University of East Sarajevo, Bosnia and Herzegovina
MSc. Selena Cevriz, Faculty of Agriculture, University of East Sarajevo, Bosnia and Herzegovina
Dr. Igor Djurdjic, Faculty of Agriculture, University of East Sarajevo, Bosnia and Herzegovina, **General Secretary**

PREFACE

Dear colleagues,

I am pleased to introduce the Book of Abstracts of the 14th International Scientific Agricultural Symposium “AGROSYM 2023”, which I hope you will find useful in your work. Almost 700 contributions have been accepted for the Book of Abstracts. The themes of AGROSYM 2023 cover all branches of agriculture and are divided into seven sessions: 1) Plant production, 2) Plant protection and food safety, 3) Organic agriculture, 4) Environmental protection and natural resources management, 5) Animal husbandry, 6) Rural development and agro-economy, and 7) Forestry and agroforestry.

Many scholars and practitioners argue that technology can increase production and feed more people while increasing supply stability and reducing the environmental impacts of agricultural production. Technology has been particularly important for improving production in annual crops such as maize, rice, soybean, wheat and cotton. Because trees have longer cycles, their breeding programs take longer. New plant breeding techniques can improve productivity, but there is a lively academic debate about their pros and cons.

While attention has been paid in the past mainly to the production side (cf. productivity, efficiency), more attention is nowadays paid to the consumption side as well as the intermediate stages (e.g. processing, distribution) of the food chain thus moving towards a ‘farm to fork’ approach. Globally, consumers are sending clearer signals about what they want on their tables i.e. higher quality as well as healthier, safer, and tastier products. Therefore, most agri-food companies have been exploring new, innovative ways to ensure more control over the production processes as well as final products quality and safety. Changes in investment strategy also have the potential to reduce the environmental and social costs of agriculture. It is now clear to most investors that companies paying more attention to sustainability and social responsibility, will have better returns on investments.

Agri-food systems have been central in the global debate on sustainable development and the achievement of the Sustainable Development Goals (SDGs) by 2030. Indeed, agri-food systems are at the center of various global challenges such as climate change, poverty, vulnerability, food insecurity, biodiversity loss, resource scarcity and ecosystem degradation. In this context, one of the goals of the sustainable agriculture movement is to develop farming systems that mitigate or eliminate environmental harms associated with industrial agriculture. It is also crucial to improve the resilience of food systems to crises, shocks and pandemics.

Many thanks to all the authors, reviewers and colleagues for their assistance in editing the Book of Abstracts. Special thanks go to all co-organizers and partners for their unselfish collaboration and comprehensive support.

East Sarajevo, 07 October 2023

Prof. Dušan Kovačević, PhD

Editor in Chief, President of the Scientific Committee of AGROSYM 2023

THE EFFECT OF MANURE AND ZEOLITE ON THE MORPHOLOGICAL TRAITS AND YIELD OF *PORTULACA OLERACEAE*

Nikolaos POLYZOS, Vasileios ANTONIADIS, Spyridon A. PETROPOULOS*

University of Thessaly, Department of Agriculture, Crop Production and Rural Environment, Fytokou Street, 38446, Volos, Greece

*Corresponding author: spetropoulos@uth.gr

Abstract

A field trial was conducted at the experimental farm of the University of Thessaly during the period of June-August 2021 in order to evaluate the effect of zeolite and manure on the growth development on purslane plants. For the conduction of the experiment, three treatments were used, namely, manure application, zeolite application and the control treatment. Each treatment included three plots with a size of 4 m², whereas in each plot seven rows of seeds of *Portulaca oleraceae* were sown with a distance of 50 cm between the rows. Regarding the manure treatment, in each plot 20 kg/plot of manure was added and incorporated in the soil with the tiller, while for the zeolite treatment 4 kg of zeolite were added and mixed in the soil in each plot. Finally, for the control treatment no amendments were applied. During, the growing period the chlorophyll content of leaves (SPAD values) and net photosynthesis (Pn) at different light intensities (PAR: 0-1200 μmol s⁻¹ m⁻²) were recorded. At harvest, the morphological traits namely the height of plants (cm), the weight of plants (g), the weight of shoots/plant (g), the weight of leaves/plant (g) and the dry matter of shoots/leaves/plants (%) were also evaluated. The trial was conducted according to a Completely Randomized Design (CRD) with three replications (n=3) per treatment. Based on the current findings, the application of manure and zeolite had a significant positive impact on the tested growth parameters, whereas the dry matter content of the aerial parts of purslane plants was not affected by the studied treatments. In conclusion, the implementation of organic matter via manure application could be a promising cultivation practice in terms of sustainability for the commercial exploitation of the species, especially in the small-scale farms of the Mediterranean basin.

Keywords: *Wild edible plants, Purslane, Manure, Zeolite, Growth parameters. Soil amendments.*

Acknowledgments: This work was funded by the General Secretariat for Research and Technology of Greece (Prima 2019-11) and PRIMA foundation under the project Valuefarm (project number 1436).

CROP ROTATION WITH LEGUME IMPROVES PURSLANE PRODUCTION AND CHANGE THE SOIL MICROBIAL COMMUNITY

Ángel CARRASCOSA¹, José Antonio PASCUAL¹, Margarita ROS¹, Jessica CUARTERO², Ana DE SANTIAGO³, Spyridon A. PETROPOULOS⁴, María del Mar ALGUACIL^{1*}

¹CSIC-Center for Soil and Applied Biology of Segura, Department of Soil and Water Conservation, Espinardo Campus, P.O. Box 164, 30100 Murcia, Spain

²Swiss Federal Institute for Forest, Snow and Landscape Research WSL, 8903 Birmensdorf, Switzerland

³Center for Scientific and Technological Research of Extremadura (CICYTEX), Plant Protection Area, Subarea of Management and Use of Agricultural and Forestry Soils, Finca la Orden Research Institute, Badajoz, Spain

⁴Department of Agriculture, Crop Production and Rural Environment, University of Thessaly, Fytokou Street, 38446 Volos, Greece

*Corresponding author: spetropoulos@uth.gr, mmalguacil@cebas.csic.es

Abstract

Intercropping systems involving leguminous species have the potential to enhance crop production sustainability by reducing input costs and improving soil fertility and diversity. In this study, we compared the effects of four legume cropping systems on purslane (*Portulaca oleracea*) plants. These systems included crop rotation (R), where peas (*Pisum sativum*) were grown in winter followed by purslane during the next summer; intercropping (I), which involved simultaneous cultivation of cowpea (*Vigna unguiculata*) and purslane in summer; rotation plus intercropping (I+R), where winter peas were followed by simultaneous cultivation of purslane and cowpea in summer; and the control (C), which consisted of sole purslane monoculture in summer. We primarily focused on purslane production, soil physiochemical properties, soil enzyme activities and fungal and bacterial taxonomical and functional structure by high-throughput sequencing, and processing sequences through metabarcoding using ITS and 16S markers, respectively. All treatments increased purslane production, with observed the greatest increase under the treatment combining intercropping and rotation (R+I). However, the soil enzymatic activity was significantly increased by the treatments R and R + I. The structure and functionality of fungal and bacterial communities were affected by R and R + I treatments, whereas C and I treatments were similar to each other. These findings suggest that while both cropping systems and their combination improved purslane growth, the effects on purslane rhizosphere were mainly influenced by crop rotation, potentially due to the purslane's ability to utilize the nitrogen fixed in the legume rhizosphere. This indicates that the composition of microbial communities, as well as their functionality and enzymatic activity, are primarily affected under the rotation cropping system which involves immediate close contact with legume roots, rather than proximity alone such as in the case of intercropping systems.

Keywords: *Cropping systems, purslane, legume, nitrogen, microbial communities.*

Acknowledgments: This work was funded by the Spanish Ministerio de Ciencia e Innovación (project PCI2020-112091), the General Secretariat for Research and Technology of Greece (project VAL-UEFARM PRIMA2019-11) and PRIMA foundation under the project VALUEFARM (PRI-MA/0009/2019).