

Serbian Society of Soil Science  
University of Belgrade, Faculty of Agriculture

# **BOOK OF ABSTRACTS**

3<sup>rd</sup> International and 15<sup>th</sup> National Congress

## **SOILS FOR FUTURE UNDER GLOBAL CHALLENGES**



21–24 September 2021  
Sokobanja, Serbia

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Prof. Dr Boško Gajić  
Assist. Prof. Dr Ljubomir Životić  
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## FOREWORD

The Serbian Society of Soil Science continues its tradition of hosting conferences, which is one of its primary activities. It organized the 3<sup>rd</sup> International and 15<sup>th</sup> National Congress – Soils for Future Under Global Challenges in the International Decade of Soils 2015–2024, collaborating with the University of Belgrade Faculty of Agriculture and under the auspices of the Ministry of Education, Science and Technological Development of the Republic of Serbia, along with sponsors and numerous contributors of papers. Namely, the International Union of Soil Sciences (IUSS) proclaimed the International Decade of Soils 2015-2024. In the Vienna Soil Declaration of 7 December 2015, IUSS recognized the key roles soils play in addressing major resource, environmental, health and social challenges currently facing humanity.

Due to the COVID-19 pandemic, the Congress was held as an online event, in combination with limited physical presence of international and domestic participants who observed the prescribed epidemiological measures and recommendations of the Serbian Government.

The topics of the Congress were grouped into the following four sessions: (i) Soil fundamentals, (ii) Soil-water-plant-atmosphere continuum, (iii) Soil degradation and soil and water conservation, and (iv) Soil and water future socio-economic pathways. The thematic areas were selected to support the distinct efforts of agriculture, and humankind in general, to deal with current resource, environmental, health and social issues.

Growing population pressures, industrialization and intensive use of soil exhaust natural resources and limit the performance of soil functions, such as biomass production, water purification, carbon sequestration, and the like. The additional impacts of climate change, land use changes and the above mentioned global changes affect the ability of soils to regenerate and even lead to degradation. The future capacity of soils to support life on Earth is in question.

A number of conferences on soil and global changes have been held worldwide over the past several years. Continuing these efforts, we need to keep in mind that the study of soils has changed rapidly. Previously, soil science was seen as supporting agriculture and forestry, and justified by increased soil productivity. However, the focus has recently expanded considerably. Soil science is now a major component of each environmental science course, given that soil plays a key role in elementary natural cycles. Soil pollution is also extremely important, often more persistent than air or water pollution. The impacts of global changes on soils are viewed from a much broader perspective than only several decades ago. However, despite the interest in new fields, the agricultural imperative must not be forgotten. Agriculture remains the main economic purpose of the use of soils and hunger is certainly among the most serious potential disasters set off by global changes.

Ninety-eight contributions were accepted for presentation at the Congress and included in this Book of Abstracts. They reflect the outcomes of the most recent research in 17 countries worldwide. The contributions were prepared by more than 320 authors and co-authors. This shows that most of the presentations were a result of teamwork, which not only guarantees a comprehensive approach, but also quality.

Seven distinguished domestic and international professors and scientists prepared the keynote speeches. The submitted papers are available on the website of the Serbian Society

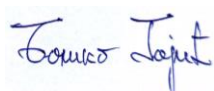
of Soil Science (<https://congress.sdpz.rs>). The contributions contained in this Book of Abstracts have been reviewed by international peers.

An excursion completed the program and content of the Congress. It included showing of four soil profiles of the dominant soil types in the Sokobanja area, including Calcomelanosol, Brownized Calcomelanosol, Calcocambisol and Vertisol, under different land uses (native meadow, devastated native pasture, native forest and intensive apple orchard).

It is our wish to see all the positive outcomes of the Congress implemented in due course, along with recommendations of scientists and professionals. This would fulfil the objective of the Congress in the best possible way. The permanent legacy of the Congress should be the inclusion of soil in the core of policies that support environmental protection and sustainable development.

In closing, I wish to express once again my sincerest gratitude to all who contributed to the publication of this Book of Abstracts.

September 2021 in Sokobanja



Prof. Dr. Boško Gajić

President of the Serbian Society of Soil Science  
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# Table of Contents

PLENARY LECTURES .....	1
CONTENT AND SCOPE OF PEDOLOGICAL RESEARCH FOR FOREST SITES MAPPING.....	2
Olivera Košanin, Rade Cvjetičanin, Marko Perović, Janko Ljubičić, Milan Knežević	
SOIL QUALITY FOR PLUM PRODUCTION IN THE ŠUMADIJA REGION .....	3
Stanko Milić, Jordana Ninkov, Milorad Živanov, Snežana Jakšić, Tijana Zeremski, Nadežda Stojanov, Jovica Vasin	
CLIMATE CHANGE AS THE DRIVING FORCE BEHIND THE INTENSIFICATION OF AGRICULTURAL LAND USE .....	4
Frank Eulenstein, Elmira Saljnikov, Sergey Lukin, Askhad Sheudshen K., Olga Rukhovich, Uwe Schindler, Galymzhan Saparov, Konstantin Pachikin, Matthias Thielicke, Axel Behrendt, Lothar Müller	
INTEGRATED WATER RESOURCES MANAGEMENT: EVOLUTION OF CONCEPT, PRINCIPLES AND APPROACHES .....	5
Mladen Todorović	
USE OF TRACERS IN SOIL EROSION RESEARCH – APPROACHES AND CHALLENGES .....	6
Jelena Petrović, Milan Đorđević, Mrđan Đokić, Ranko Dragović, Boško Gajić, Ljiljana Janković Mandić, Snežana Dragović	
CHEMOMETRICS FOR SOIL POLLUTION MONITORING.....	7
Antonije Onjia	
ASSESSMENT OF SPATIAL VARIABILITY OF SOIL CONTAMINATION: USE OF A MULTI-SCALE APPROACH ASSOCIATING PROXIMAL SENSORS, PEDOLOGICAL AND MICROSCOPICAL INVESTIGATIONS .....	8
Simona Vingiani	
SECTION 1: Soil Fundamentals .....	9
ELEMENTAL COMPOSITION OF HUMIC ACIDS ISOLATED FROM CHERNOZEMS, VERTISOLS, REGOSOLS, PLANOSOLS AND HISTOSOLS .....	10
Svjetlana Radmanović, Mirjana Marković, Nikola Živković, Đuro Čokeša, Uroš Jovanović, Jelena Bogosavljević	
HOLOCENE RUBIFICATION IN BOREAL AND SUBBORIAL SOILS OF WESTERN SIBERIA: A PEDOGEOGRAPHICAL ANALYSIS .....	11
Alina Kurasova, Alexandr Konstantinov, Sergey Loiko, Sergey Kulizhskiy	
TEMPERATURE AND MOISTURE REGIMES OF RENDZINA SOILS IN SERBIA ACCORDING TO THE USDA SOIL TAXONOMY SYSTEM.....	12
Svjetlana Radmanović, Aleksandar Đorđević	
CORRELATION BETWEEN RANKER SOIL TYPE OF NATIONAL CLASSIFICATION SYSTEM AND LEPTOSOLS REFERENCE SOIL GROUP OF WORLD REFERENCE BASE FOR SOIL RESOURCES – THEORETICAL APPROACH.....	13

Ljubomir Životić, Aleksandar Đorđević, Day Boitumelo Mohlala, Jelena Bogosavljević, Lazar Kaluđerović	
PEDO–EXCEL: A SIMPLE EXCEL TOOL/DATABASE TO PREPARE AND ELABORATE SOIL PROFILE DATA.....	14
Mirko Knežević, Ana Topalović, Ljubomir Životić	
MICROBIOLOGICAL AND CHEMICAL PROPERTIES OF AGRICULTURAL SOILS IN SOUTH-WESTERN SERBIA .....	15
Snežana Andjelković, Zoran Lugić, Snežana Babić, Jordan Marković, Vladimir Zornić, Mirjana Petrović, Filip Bekčić	
BACTERIAL COMMUNITIES IN ACIDIC SOILS .....	16
Jelena Jovičić-Petrović, Mira Milinković, Vera Karličić, Blažo Lalević, Igor Kljujev, Vera Raičević	
CHARACTERISTICS OF SOIL QUALITY OF THE SURČIN MUNICIPALITY AND ITS SIGNIFICANCE FOR PLANT PRODUCTION .....	17
Marina Jovković, Jelena Maksimović, Zoran Dinić, Darko Jaramaz, Radmila Pivić, Aleksandra Stanojković-Sebić	
WATER-PHYSICAL, MECHANICAL AND CHEMICAL PROPERTIES OF ARIC REGOSOLS FROM POVARDARIE REGION .....	18
Mile Markoski, Tatjana Mitkova, Vjekoslav Tanaskovik, Stojanche Nechkovski	
TOXIC ELEMENTS IN SOILS FROM VLASINA REGION .....	19
Sanja Sakan, Aleksandra Mihajlidi Zelić, Sandra Škrivanj, Stanislav Frančišković Bilinski, Halka Bilinski, Dragana Đorđević	
STRUCTURAL STABILITY OF AGGREGATES OF VERTISOLS DEPENDING ON THE CONTENT OF ORGANIC MATTER, CLAY and CALCIUM CARBONATE .....	20
Dragan Radovanović, Ljiljana Nešić, Vladimir Ćirić, Dragana Marinković, Bojan Vojnov	
CONTENT OF AVAILABLE CALCIUM AND MAGNESIUM IN THE VERTISOLS OF THE PČINJA DISTRICT .....	21
Sladana Golubović, Aleksandar Đorđević, Mladen Dugonjić, Sanja Perić, Dobrila Randelović, Milić Vojinović	
ANDOSOLS AND PROBLEMS OF THEIR CLASSIFICATION IN CONDITIONS OF SLOVAKIA .....	22
Jozef Kobza	
DIVERSITY AND PLANT GROWTH PROMOTING POTENTIAL OF RHIZOBIA ISOLATED FROM ROOT NODULES OF <i>LOTUS CORNICULATUS</i> L.....	23
Magdalena Knežević, Aneta Buntić, Merisa Avdović, Nataša Rasulić, Đorđe Kuzmanović, Dušica Delić, Olivera Stajković-Srbinović	
MINERALOGICAL COMPOSITION OF GAJNJAČA SOIL IN KRNJEVO VITICULTURE AREA .....	24
Nataša Nikolić, Zorica Tomić, Lazar Kaluđerović, Aleksandar Đorđević	
PEDOLOGICAL CHARACTERISTICS OF GREEK MAPLE ( <i>Acer heldreichii</i> Orph.) SITES IN SERBIA .....	25
Marko Perović, Olivera Košanin, Rade Cvjetićanin	
COMPARATIVE ANALYSIS OF PHYSICO-CHEMICAL AND MICROBIOLOGICAL PARAMETERS OF SOIL UNDER <i>MISCANTHUS GIGANTEUS</i> GROWN IN DIFFERENT AGRO-ECOLOGICAL CONDITIONS.....	26

Zoran Dinić, Magdalena Knežević, Radmila Pivić, Aleksandra Stanojković-Sebić, Željko Dželetović, Marina Jovković, Jelena Maksimović

**ORGANIC FARMING PRACTICE IMPROVES SOIL MICROBIAL PROPERTIES UNDER SOYBEAN PRODUCTION ..... 27**

Jelena Marinković, Dragana Miljaković, Branislava Tintor, Gorica Cvijanović, Vuk Đorđević, Vojin Đukić, Marjana Vasiljević

**RESEARCH ON THE FAUNA OF EARTHWORMS (ANNELIDA: LIGOCHAETA) OF SOKOBANJA ..... 28**

Jovana Sekulić, Mirjana Stojanović, Tanja Trakić, Filip Popović, Gorica Cvijanović

**SOIL STRUCTURE OF CALCOMELANOSOLS FROM THE RTANJ MOUNTAIN, SERBIA ..... 29**

Jelena Bogosavljević, Svjetlana Radmanović, Ljubomir Životić, Lazar Kaluđerović, Aleksandar Đorđević

**SOIL CLASSIFICATION AND PHYSICAL PROPERTIES OF SOILS OF ŠUMADIJA REGION UNDER PLUM ORCHARDS ..... 30**

Milorad Živanov, Jovica Vasin, Stanko Milić, Jordana Ninkov, Snežana Jakšić, Dušana Banjac

**THE VALUE OF DIFFERENT TYPES OF ACIDITY OF PSEUDOGLEY SOILS IN THE KRALJEVO BASIN UNDER DIFFERENT LAND USES ..... 31**

Goran Dugalić, Marijana Dugalić, Ljiljana Bošković-Rakočević, Vera Rajčić

**SECTION 2: Soil-water-plant-atmosphere continuum ..... 32**

**PROPERTIES AND GROUNDWATER LEVEL OF HUMOGLEY SOIL OF SOUTHERN BAČKA ..... 33**

Saša Pekeč, Marina Milović, Velisav Karaklić

**EFFECT OF *CHLORELLA VULGARIS* ON SWISS CHARD (*BETA VULGARIS* L. VAR. *CICLA*) GROWTH PARAMETERS AND YIELD ..... 34**

Vladimira Seman, Timea Hajnal-Jafari, Dragana Stamenov, Simonida Đurić

**GROSS SOIL SURFACE BALANCES OF N, P AND K UNDER ORGANIC AND MINERAL FERTILIZATION ..... 35**

Sebastian Kuśmierz, Monika Skowrońska, Piotr Ochal, Tamara Jadczyzsyn, Tadeusz Filipek

**IMPACT OF BARK BEETLE-INDUCED FOREST DIEBACK ON SOIL BASE CATIONS AND NITRATES, AND ITS CONSEQUENCE ON FRESHWATER COMPOSITION ..... 36**

Jiří Kaňa, Jiří Kopáček

**ASSESSMENT OF A SMARTPHONE APP FOR POTATO IRRIGATION SCHEDULING ..... 37**

Marie Therese Abi Saab, Ihab Jomaa, Sleiman Skaf, Salim Fahed, Rend Sleimen, Rossella Albrizio, Mladen Todorović

**DECOMPOSITION of SILVER BIRCH LEAF LITTERFALL AND NUTRIENTS RELEASE AT POST-ARABLE STANDS UNDER TEMPERATE CLIMATE ..... 38**

Jerzy Jonczak, Lidia Oktaba, Edyta Pawłowicz, Sandra Słowińska, Marek Kondras, Edyta Regulska, Bogusława Kruczkowska, Urszula Jankiewicz, Izabella Olejniczak, Jarosław Oktaba

**EFFECT OF DRIP IRRIGATION ON YIELD, EVAPOTRANSPIRATION AND WATER PRODUCTIVITY OF POTATO IN SEMIARID ENVIRONMENT ..... 39**

Borivoj Pejić, Svetozar Samardžić, Ivana Bajić, Ksenija Mačkić, Vladimir Čirić, Miroljub Aksić

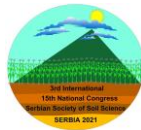
<b>FUNGAL MICROBIOME OF FOREST SOIL: A HIDDEN MICROCOSMOS UNDER BLUEBERRY ROOTS.....</b>	<b>40</b>
Vera Karličić, Jelena Jovičić-Petrović, Igor Kljujev, Vesna Golubović Čurguz, Blažo Lalević, Vera Raičević	
<b>THE INFLUENCE OF BIRCH AFFORESTATION OF POST-ARABLE SOILS ON SOIL ORGANIC MATTER COMPOSITION .....</b>	<b>41</b>
Lidia Oktaba, Jerzy Jonczak, Marek Kondras, Edyta Pawłowicz, Bogusława Kruczkowska, Urszula Jankiewicz, Jarosław Oktaba, Izabela Olejniczak, Edyta Regulska, Sandra Słowińska	
<b>IMPACT OF NATURE BASED SOLUTIONS FOR FLOOD RISK MANAGEMENT ON SOIL AND AGRICULTURAL DEVELOPMENT - EU CONSIDERATION AND SERBIAN PROSPECTIVE .....</b>	<b>42</b>
Ružica Stričević, Zorica Srđević, Nevenka Đurović, Aleksa Lipovac Marijana Kapović Solomun, Vesna Zupanc, Kristina Potočki	
<b>SYNERGISTIC EFFECT OF <i>BACILLUS</i> ISOLATES AND BIOMASS ASH ON SOIL AND BARLEY PLANT QUALITY .....</b>	<b>43</b>
Aneta Buntić, Sonja Tošić, Magdalena Knežević, Marina Jovković, Biljana Sikirić, Nikola Koković, Elmira Saljnikov	
<b>MICROBIOLOGICAL-SANITARY QUALITY OF SOIL AND SAFE VEGETABLE PRODUCTION .....</b>	<b>44</b>
Igor Kljujev, Vera Karličić, Jelena Jovičić-Petrović, Blažo Lalević, Vera Raičević	
<b>WATER QUALITY MONITORING OF THE FIRST AQUIFER IN THE AREA OF IRRIGATION SYSTEMS OF SOUTHWESTERN BAČKA.....</b>	<b>45</b>
Ksenija Mačkić, Ljiljana Nešić, Borivoj Pejić, Milivoj Belić, Vladimir Ćirić, Lazar Pavlović	
<b>THE EFFECT OF GRASS COVER N FERTILIZATION ON QUALITY OF CABERNET SAUVIGNON CV GRAPES .....</b>	<b>46</b>
Aleksandar Simić, Zoran Pržić, Željko Dželetović, Marija Ćosić, Gordana Andrejić, Nebojša Marković, Snežana Brajević	
<b>DETERMINATION OF IRRIGATION REGIME IN VINE ORCHARDS IN POVARDARIE REGION OF NORTH MACEDONIA MONITORED WITH QGIS .....</b>	<b>47</b>
Stojanche Nechkovski, Vjekoslav Tanaskovik, Ordan Cukaliev, Mile Markoski	
<b>MINERAL COMPOSITION OF WHEAT GRAINS DEPENDING ON NITROGEN AND ZINC FERTILIZATION.....</b>	<b>48</b>
Ranko Čabilovski, Maja Manojlović, Klara Petković, Dragan Kovačević, Mirna Štrbac, Milana Vondraček	
<b>COMPARISON OF NDVI AND ARVI VEGETATION INDICES: CASE STUDY IN THE CITY OF BELGRADE, SERBIA .....</b>	<b>49</b>
Darko Jaramaz, Vesna Mrvić, Radmila Pivić, Sonja Tošić, Biljana Sikirić, Aleksandra Stanojković-Sebić, Jelena Maksimović	
<b>EFFECT OF DIGESTATES AND MANURES APPLICATION ON KOHLRABI YIELD AND QUALITY.....</b>	<b>50</b>
Dragan Kovačević, Maja Manojlović Ranko Čabilovski, Klara Petković, Zoran Ilić, Abu Baker Brayek, Mirna Štrbac, Mirjana Trninić	
<b>EFFECTS OF APPLICATION METHOD AND TYPE OF MINERAL FERTILIZERS ON ACID SOIL FERTILITY .....</b>	<b>51</b>
Biljana Sikirić, Olivera Stajković-Srbinić, Nikola Koković, Elmira Saljnikov, Marina Jovković, Aneta Buntić, Vesna Mrvić	

FOLIAR APPLICATION OF ZINC IN ALFALFA PRODUCTION.....	52
Klara Petković, Maja Manojlović, Ranko Čabilovski, Đorđe Krstić, Dragan Kovačević, Mirna Štrbac	
MICROGRANULATES AND BIOSTIMULANTS AS ALTERNATIVES TO DIAMMONIUM PHOSPHATE FERTILIZER IN MAIZE PRODUCTION ON MARSHLAND SOILS IN NORTHWEST GERMANY .....	53
Matthias Thielicke, Julian Ahlborn, Frank Eulenstein	
WATER REQUIREMENTS OF FRUIT AND VINE PLANTATIONS IN THE AREA OF THE KOLUBARA DISTRICT IN PRESENT AND FUTURE CLIMATE CONDITIONS .....	54
Marija Ćosić, Aleksa Lipovac, Mirjam Vujadinović Mandić, Ružica Stričević, Nevenka Đurović, Zorica Ranković Vasić, Ljubomir Životić	
GROWTH CONTROL AND FRUIT QUALITY OF APPLE CULTIVAR ‘GALA SCHNIGA’ USING ROOT PRUNING TECHNIQUE .....	55
Boban Đorđević, Dejan Đurović, Gordan Zec, Đorđe Boškov, Vladimir Skoko	
EMERGENCE AND INITIAL GROWTH OF ALLIUM URSINUM IN DIFFERENT SOIL TYPES.....	56
Stefan Gordanić, Dragoja Radanović, Sara Mikić, Snežana Mrđan, Željana Prijić, Tatjana Marković, Đorđe Moravčević	
INFLUENCE OF MYCORRHIZAL FUNGI ON SATUREJA MONTANA L. GROWN IN CHERNOZEM AND ARENOSOL.....	57
Snežana Mrđan, Jovan Crnobarac, Dragoja Radanović, Tatjana Marković, Simonida Đurić, Vladimir Filipović, Ana Dragumilo, Stefan Gordanić, Sara Mikić, Željana Prijić	
PREDICTION OF SOIL TEMPERATURE BY AIR TEMPERATURE: A CASE STUDY FOR RIMSKI ŠANČEVI.....	58
Slavica Radovanović, Gordana Matović, Željko Mardešić, Enika Gregorić, Vesna Počuča	
PROJECTION OF THE WATER REGIME PARAMETERS OF ZEMUN CHERNOZEM FOR WINTER WHEAT PRODUCTION BY THE END OF THE 21 <sup>ST</sup> CENTURY .....	59
Gordana Matović, Vesna Počuča, Enika Gregorić, Mirjam Vujadinović Mandić	
THE ISSUE ABOUT FERTILIZER RECOMMENDATION IN APPLE ORCHARDS IN NORWAY.....	60
Vlado Ličina, Milica Akšić Fotirić, Aleksandar Simić, Tore Krogstad, Mekjell Melland	
NATURAL CHARACTERISTICS OF THE GACKO AREA.....	61
Vesna Tunguz, Ljiljana Nešić, Nebojsa Novkovic	
A COMPARISON OF FIVE METHODS FOR REFERENCE EVAPOTRANSPIRATION ESTIMATION IN THE WEST, CENTRAL, EASTERN, AND SOUTHERN SERBIA ..	62
Dunja Sotonica, Aleksa Lipovac, Ružica Stričević, Nevenka Đurović, Marija Ćosić	
SECTION 3: Soil degradation and soil and water conservation .....	63
CHANGES OF THE SOIL ENVIRONMENT AFFECTED BY FLY ASH DUMPING SITE OF THE ELECTRIC POWER PLANT.....	64
Jerzy Weber, Andrzej Kocowicz, Lilla Mielnik, Elżbieta Jamroz	
FTIR SPECTROSCOPIC STUDY OF S-METOLACHLOR SORPTION ON INORGANIC AND ORGANICALLY MODIFIED MONTMORILLONITE FROM BOGOVINA.....	65

Lazar Kaluđerović, Zorica Tomić, Jelena Bogosavljević, Ljubomir Životić, Maja Milošević	
THE IMPACT OF AGRICULTURE ON THE GLEYSOL AND FLUVISOL SOILS: CASE STUDY IN PODRAVINA REGION, CROATIA.....	66
Stanko Ružičić, Josip Šušnjar, Sibila Borojević Šoštarić, Tomislav Brenko	
SOIL TYPES AND THEIR SENSITIVITY TO THE ACIDIFICATION PROCESS IN THE MUNICIPALITIES OF KOSJERIĆ, POŽEGA AND UŽICE .....	67
Olivera Košanin, Janko Ljubičić, Jelena Beloica, Snežana Belanović Simić, Predrag Miljković, Milan Knežević	
THE IMPACT OF TAILING OUTFLOW ON THE AVAILABILITY OF POTENTIALLY TOXIC ELEMENTS (Zn, Cu, Pb, Cd) IN SOILS NEAR TO FORMER MINE STOLICE (SERBIA) .....	68
Snežana Belanović Simić, Predrag Miljković, Jelena Beloica, Sara Lukić, Aleksandar Baumgertel, Voijin Ilić, Toplica Đukić, Ratko Kadović	
THE IMPORTANCE OF SOIL DATA UNIFICATION FROM SERBIAN AGRICULTURAL ADVISORY SERVICE AND ACCOMPANYING PROBLEMS .....	69
Dragana Marinković, Vladimir Ćirić, Pavel Benka, Oskar Marko, Ljiljana Nešić	
UNCERTAINTY OF SOILGRIDS TESTED ON 1 200 000 SOIL DATA FROM NATIONAL SOIL FERTILITY CONTROL .....	70
Vladimir Ćirić, Dragana Marinković, Pavel Benka, Oskar Marko	
TRACE ELEMENTS AND POLYCYCLIC AROMATIC HYDROCARBONS IN ANTARCTIC SOILS: VARIABILITY ACROSS LANDSCAPES .....	71
Ivan Alekseev, Evgeny Abakumov	
THE CONTENT OF Cd AND Pb IN UNDEVELOPED SOILS AND PLANT MATERIAL IN THE AREA OF NP (NATIONAL PARK) TARA .....	72
Angelina Novaković, Stefan Miletić, Jelena Beloica, Snežana Belanović Simić, Dragica Obratov-Petković	
ADAPTATION OF THE FARMING SYSTEM WITH COVER CROPS GROWING FOR INCREASING SOIL CARBON SEQUESTRATION .....	73
Vladan Ugrenović, Elmira Saljnikov, Nikola Koković, Olivera Stajković-Srbinić, Dušica Delić, Tara Grujić, Srđan Šeremešić	
DISSOLVED ORGANIC CARBON AS A CONTROLLING FACTOR OF NICKEL AVAILABILITY IN RECLAMATION OF BARREN SOIL .....	74
Svetlana Antić Mladenović, Mirjana Kresović, Walter Wenzel, Matija Krpović, Vlado Ličina	
LEAD IN ALLUVIAL SOILS CONTAMINATED BY MINING ACTIVITY.....	75
Radoslava Kanianska, Jozef Varga, Nikola Benková, Miriam Kizeková, Ľubica Jančová	
CONTENT OF ORGANIC CARBON SOLUBLE IN HOT WATER (HWOC) IN WINTER COVER CROPS WITH SUBSEQUENT SOWING OF MAIZE GROWN ON CHERNOZEM.....	76
Bojan Vojnov, Srđan Šeremešić, Branko Ćupina, Djordje Krstić, Svetlana Vujić, Milorad Živanov, Dragan Radovanović	
ASSESSMENT OF SOIL EROSION USING THE EROSION POTENTIAL METHOD AND THE UNIVERSAL SOIL LOSS EQUATION IN THE GRAČANICA RIVER CATCHMENT (PRIJEPOLJE).....	77
Milica Čaković, Aleksandar Baumgertel, Predrag Miljković	

PLATINUM GROUP ELEMENTS AND RARE EARTH ELEMENTS IN URBAN PARK SOILS IN NOVI SAD, SERBIA.....	78
Maja Manojlović, Massimo Angelone, Dragana Vidojević, Giovanna Armiento, Ranko Čabilovski, Vladimir Ćirić, Maria Rita Montereali, Cinzia Crovato, Maurizio De Cassan	
CONTENT OF HEAVY METALS IN ARABLE PLOTS OF RASINA DISTRICT .....	79
Biljana Sikirić, Vesna Mrvić, Olivera Stajković-Srbinović, Zoran Dinić, Darko Jaramaz, Nikola Koković	
SOIL FERTILITY IN ORGANIC AND CONVENTIONAL PRODUCTION SYSTEMS .....	80
Mirna Štrbac, Maja Manojlović, Ranko Čabilovski, Klara Petković, Dragan Kovačević	
THE INFLUENCE OF SOIL ORGANIC MATTER ON ADSORPTION BEHAVIOUR OF TERBUTHYLAZINE IN BIOCHAR AMENDED SOILS .....	81
Nadežda Stojanov, Tijana Zeremski, Snežana Maletić, Jelena Tričković	
SPATIAL PREDITION OF THE SOIL ORGANIC MATTER IN SOILS OF OHRID VALLEY.....	82
Duško Mukaetov, Hristina Poposka, Marjan Andreevski	
MERCURY TOTAL CONTENT ACROSS SOIL TYPES IN AGRICULTURAL LAND OF VOJVODINA PROVINCE (SERBIA).....	83
Jordana Ninkov, Stanko Milić, Jovica Vasin, Snežana Jakšić, Milorad Živanov, Dušana Banjac, Gorica Cvijanović	
SPARSELY CROSSLINKED BIODEGRADABLE HYDROGEL AS A MULTIFUNCTIONAL SOIL AMENDMENT .....	84
Leonid Ilyasov, Nikolay Khrabrov, Irina Panova	
SURVEY OF TERRAIN DEPRESSION USING UNMANNED AERIAL VEHICLE .....	85
Pavel Benka, Nenad Antoniće, Radoš Zemunac, Atila Bezdán	
CARBON SATURATION POTENTIAL IN LONG-TERM WINTER WHEAT CROPPING SYSTEMS ON CHERNOZEM.....	86
Srđan Šeremešić, Stanko Milić, Jovica Vasin, Bojan Vojnov, Vladimir Ćirić, Vladan Ugrenović, Milorad Živanov	
LAND COVER/LAND USE IN SERVICE OF AGRICULTURAL LAND PROTECTION, USE AND RESTRUCTURING .....	87
Tihomir Predić, Petra Nikić-Nautha, Stefan Jovanović	
THE DYNAMICS OF CHEMICAL PROPERTIES IN THE MINE TECHNOSOLS AFTER SIX YEARS OF RECLAMATION.....	88
Nenad Malić, Mihajlo Marković	
BIOACCUMULATION OF CHROMIUM IN MEDICAGO SATIVA L. AND TRIFOLIUM PRATENSE L. ON DIFFERENT SOIL TYPES OF SERBIA .....	89
Snežana Jakšić, Savo Vučković, Jordana Ninkov, Jovica Vasin, Stanko Milić, Milorad Živanov, Vedrana Komlen	
ECONOMIC MODEL OF RAISING SOUR CHERRY PLANTATIONS ON TECHNICALLY RECULTIVATED LAND AREA .....	90
Zorica Sredojević, Boško Gajić, Nataša Kljajić, Nevena Čule	
POLLUTION INDICES OF TRACE ELEMENTS IN SOILS OF PČINJA AND JABLANICA DISTRICTS .....	91
Andrijana Miletić, Milica Lučić, Aleksandar Đorđević, Antonije Onjia	

NATURALLY OCCURRING RADIONUCLIDES AND BASIC CHARACTERISTICS OF SOIL AND ASH SAMPLES NEARBY COAL-FIRED POWER PLANTS .....	92
Ivana Vukašinović, Dragana Todorović, Nataša Nikolić	
LAND USE EFFECTS ON SOIL PORE-SIZE DISTRIBUTION AND SOIL WATER RETENTION .....	93
Boško Gajić, Branka Kresović, Miodrag Tolimir, Ljubomir Životić, Aleksa Lipovac, Katarina Gajić, Angelina Tapanarova, Zorica Sredojević	
ANTHROPOGENIC INFLUENCE ON HUMUS CONTENT IN DIFFERENT SOIL TYPES .....	94
Jovica Vasin, Snežana Jakšić, Milorad Živanov, Jordana Ninkov, Stanko Milić, Dušana Banjac, Vladimir Ćirić	
SECTION 4: Soil and water future socio-economic pathways .....	95
NEW APPROACH TO IMPROVE WATER QUALITY IN THE DANUBE REGION BASED ON THE ECOSYSTEM SERVICES IN FLOODPLAINS: IDES PROJECT .....	96
Zorica Srđević, Jasna Grabić, Bojan Srđević, Pavel Benka, Senka Ždero, Milica Ilić, Nenad Antić	
PROMOTING THE APPLICATION OF SMART TECHNOLOGIES IN AGRICULTURAL WATER MANAGEMENT IN BOSNIA AND HERZEGOVINA ....	97
Mihajlo Marković, Nataša Čereković, Đurađ Hajder, Nery Zapata, Teresa A. Paço, Erminio Efisio Riezzo, Sabrija Čadro, Mladen Todorović	
THE SPANISH SOCIETY OF SOIL SCIENCE: ACTIVITIES AND PROJECTS .....	98
Jorge Mataix-Solera, Gael Bárcenas-Moreno, Irene Ortíz-Bernad, Engracia Madejón, Sara Ibáñez-Asensio, Oriol Ortiz, David Badía, Xosé L. Otero, Miquel Aran	
ASSOCIATION FRANÇAISE POUR L'ETUDE DU SOL: 1934-2021 (FRENCH SOCIETY OF SOIL SCIENCE: 1934-2021).....	99
Jacques Thomas (chair), Agnès Gosselin (secretary), Denis Baize (treasurer), Christian Feller (past chair)	
ENHANCING MANAGEMENT OF CONTAMINATED SITES USING ENVIRONMENTAL MONITORING DATA AND PRELIMINARY RISK ASSESSMENT METHODOLOGY IN SERBIA .....	101
Dragana Vidojević, Darko Damjanović, Lana Kukobat, Nemanja Jevtić, Aleksandra Siljić Tomić	
THE BRITISH SOCIETY OF SOIL SCIENCE .....	102
Sarah Garry	
SOCIETAS PEDOLOGICA SLOVACA .....	103
Jozef Kobza	
CERES PROJECT: COUPLING EARTH OBSERVATION BASED INFORMATION AND ARTIFICIAL INTELLIGENCE FOR SOIL ORGANIC CARBON SPATIAL MODELLING .....	104
Branislav Bajat, Milan Kilibarda, Dragutin Protić, Milutin Pejović, Miloš Kovačević, Ognjen Antonijević, Mileva Samardžić Petrović, Aleksandar Sekulić, Petar Bursać, Mladen Nikolić	



Soils for Future under Global Challenges

## **ENHANCING MANAGEMENT OF CONTAMINATED SITES USING ENVIRONMENTAL MONITORING DATA AND PRELIMINARY RISK ASSESSMENT METHODOLOGY IN SERBIA**

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### **Abstract**

According to the Law on Soil Protection, the Cadastre of Contaminated Sites is a set of relevant data on endangered, polluted, and degraded soil. Serbian Environmental Protection Agency (SEPA) has been constantly working to improve the national methodology for collection, analysis and assessment of data on contaminated sites. The last updated database of the Cadastre shows that 309 potentially contaminated and contaminated sites have been identified and recorded on the territory of the Republic of Serbia. The main purpose of the Cadastre is to provide systematic data on sources of pollution such as the type, quantities, methods, and location of discharges of pollutants into the soil, in order to implement preventive or remediation measures. Data collection is defined in more detail in the Rulebook on the content and manner of keeping the Cadastre of contaminated sites, type, content, forms, manner, and deadlines for data submission. Investigation of industrial sites suspected to be contaminated was a part of the GEF-funded project Enhanced Cross-sectoral Land Management through Land Use Pressure Reduction and Planning which is implemented by United Nations Environment Programme (UNEP) in close cooperation with the Ministry of Environmental Protection and SEPA in the period 2015–2019. The main goals of the Project were to provide the lacking methodologies, knowledge, and coordination mechanisms for sustainable and integrated management of soil as a natural resource. The Project also supported further development of a Cadastre of contaminated sites and preliminary analysis of selected 32 potentially contaminated sites. Field missions to the identified sites were conducted in 2016 with the purpose to identify receptors of pollution and potential exposure routes, previous land use, surface area, type and quantity of hazardous substances found at the location and in the surrounding area, soil and groundwater quality, as well as geological, pedological and hydrological features and to prepare and elaborate sampling programs, whereas the soil sampling itself took place in 2017 when 264 soil samples were analyzed. Site specific environmental monitoring data and soil sampling results allowed performing the comparative analysis and application of preliminary risk assessment methodology that served to compile the relative risk-based priority list of 32 sites. For this purpose, the Preliminary Risk Assessment Model for the identification and assessment of problem areas for Soil contamination in Europe – PRA.MS has been applied.

**Keywords:** Contaminated sites, Preliminary Risk Assessment, remediation