



**XI INTERNATIONAL SYMPOSIUM OF  
AGRICULTURAL SCIENCES**

**BOOK OF ABSTRACTS**

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**XI INTERNATIONAL  
SYMPOSIUM OF  
AGRICULTURAL SCIENCES**

**26-28, May, 2022  
Trebinje  
Bosnia and Herzegovina**

## BOOK OF ABSTRACTS



XI International Symposium of Agricultural Sciences "AgroReS 2022"  
26-28. May, 2022; Trebinje, Bosnia and Herzegovina

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*Editor in Chief*

Branimir Nježić

*Technical Editors*

Biljana Kelečević  
Danijela Kuruzović

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# **SYMPOSIUM PROGRAM**

## PROGRAM OVERVIEW

<b>Thursday 26 May</b>		
13:00 – 18:00	Symposium registration	Coloseum
14:30 – 15:00	Opening ceremony	Hall 2
15:00 – 16:15	Plenary lectures	
16:15 – 16:45	Coffee break	Hotel Panorama
16:45 – 18:00	Plenary lectures	Hall 2
18:00 – 19:00	Drinks reception	Entno village
20:30 – 21:30	Concert of Trebinje Church Choir St. Vasilije Ostrški and Trebinjski	Coloseum
<b>Friday 27 May</b>		
08:30 – 17:00	Symposium registration	Coloseum
09:00 – 11:10	Session 1 Crop science 1	Hall 1
11:20 – 11:40	Coffee break	Hotel Panorama
11:40 – 13:30	Sesion 1 Crop science 2	Hall 1
09:00 – 11:30	Session 2 Horticulture 1	Hall 2
11:30 – 12:00	Coffee break	Hotel Panorama
12:00 – 14:00	Session 2 Horticulture 2	Hall 2
09:00 – 11:00	Session 3 Agricultural economics and rural development	Hall 3
11:00 – 11:30	Coffee break	Hotel Panorama
11:30 – 13:30	Session 4 Animal science	Hall 3
13:30 – 15:30	Lunch break	Hotel Panorama
15:30 – 17:30	Raund table	Hall 1
16:00 – 18:00	Conference of agricultural engineers of the Republic of Srpska	Hall 2
20:00	Gala evening	Hotel Panorama
<b>Saturday 27 May, 2022</b>		
09:00 – 13:00	Conference Tour	Milk factory Pađeni and Monastery Dobričevo

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## SCIENTIFIC PROGRAM

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**Thursday, May 26**

	The City of Sun'Trebinje Hall 2
<b>14:30 – 15:00</b>	<ul style="list-style-type: none"> <li>- Zlatan Kovačević, Dean of the Faculty of Agriculture, University of Banja Luka;</li> <li>- Radoslav Gajanin, Rector of the University of Banja Luka;</li> <li>- Boris Pašalić, Minister of Agriculture, Forestry and Water Management of the Republic of Srpska;</li> <li>- Srđan Rajčević, Minister for Scientific and Technological Development, Higher Education and Information Society;</li> <li>- Mladen Todorović, IAMB</li> <li>- Branimir Nježić, President of the Organizing Committee.</li> </ul>
	The City of Sun'Trebinje Hall 2
<b>Chair: Branimir Nježić, Mladen Todorović</b>	
<b>15:00 – 15:25 PL_01</b>	Carlo Leifert INTEGRATED SOIL, CROP AND LIVESTOCK MANAGEMENT IN ORGANIC AGRICULTURE; A LOGICAL FRAMEWORK TO ENSURE FOOD SECURITY AND HUMAN HEALTH?
<b>15:25 – 15:50 PL_02</b>	Mary Ann Lila IF FOOD IS MEDICINE, THEM HOW CAN WE INCREASE ITS INFLUENCE ON IMMUNE HEALTH?
<b>15:50 – 16:15 PL_03</b>	Manuel Mota PLANT PARASITIC NEMATODES, FROM SOIL TO TOP OF PLANT: A CHALLENGE FOR OUR TIME
<b>16:15 – 16:45</b>	Coffee break
<b>16:45 – 17:10 PL_04</b>	Felix H. Arion DOING AGRIBUSINESS IN A COMPETITIVE ENVIRONMENT
<b>17:10 – 17:35 PL_05</b>	Z.T. Popovski, B. Tanaskovski, E. Miskoska – Milevska M. Terzic FURTHER CHALLENGES OF GENETIC MODIFICATION IN AGRICULTURE
<b>17:35 – 18:00 PL_06</b>	Milan Miroslavljević, Vojislava Momčilović, Tanja Dražić, Vladimir Aćin CHANGES IN PHYSIOLOGICAL AND QUALITY TRAITS RELATED TO THE BREEDING PROGRESS
<b>18:00 – 19:00</b>	Drinks reception

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**Friday, May 27**

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**SESSION 1: CROP SCIENCE 1**

**Oral Presentations**

The City of Sun`Trebinje Hall 1

**Chair: Novo Pržulj, Mihajlo Marković, Jan Turan**

<b>09:00-09:15</b> O1_01	Nedović Viktor, <b>Invited lecture</b> SMART SPECIALIZATION STRATEGY: CONCEPT, METHODOLOGY, AGRI-FOOD AS AREA OF PRIORITY, REGIONAL VALUE CHAIN
<b>09:15-09:25</b> O1_02	Mihajlo Marković, Zlatan Kovačević, Vojo Radić, Nataša Čereković, Jovana Žunić, Mladen Babić, Nery Zapata, Teresa A. Paço, Erminio Efisio Riezzo, Benjamin Crljenković, Sabrija Čadro, Mladen Todorović SMART AGRICULTURAL WATER MANAGEMENT OF MAIZE CROP CULTIVATION ON TWO DIFFERENT PEDOCLIMATIC LOCATIONS IN BOSNIA AND HERZEGOVINA
<b>09:25-09:35</b> O1_03	Miloš Nožinić, Novo Pržulj, Dejan Simić ANALYSIS OF CLIMATE CHANGES IN PERI - PANNONIAN BASIN AND DINARIC REGION / BASIS FOR FUTURE AGRICULTURAL STRATEGIES
<b>09:35-09:45</b> O1_04	Zapata, N., Playán, E., Castillo, R., Gimeno, Y., Oliván, I., Jiménez, A, Carbonell, X., Fabregas, M., López-Pardo, J.R., Vicente, L.M., Millán, J., Solano, D., Lorenzo, M.A. CLASSIFICATION OF IRRIGATED AREAS: APPLICATION TO THE CENTRAL EBRO RIVER BASIN (SPAIN)
<b>09:45-09:55</b> O1_05	Enrique Playán, Nery Zapata, Borja Latorre, Javier Burguete IRRIGATION, HYDROLOGY AND CROP YIELD SIMULATION IN A SOLID-SET SPRINKLER IRRIGATED FARM
<b>09:55-10:05</b> O1_06	Vladimir Višacki, Jan Turan, Aleksandar Sedlar, Patrik Burg, Vladimir Masan, Rajko Bugarin, Filip Vasić VARIABLE CORN SOWING BASED ON SOIL POTENTIAL
<b>10:05-10:15</b> O1_07	Marko Mladenović, Jovan Pavlov, Zoran Čamdžija, Aleksandar Kovačević, Sanja Perić, Olivera Đorđević Melnik, Nikola Grčić GRAIN YIELD PERFORMANCE AND ADAPTATION TO DIFFERENT ENVIRONMENTAL CONDITIONS OF ZP COMMERCIAL MAIZE HYBRIDS
<b>10:15-10:25</b> O1_08	Savo Vučković, Vera Popović, Vojo Radić, Dragan Terzić PRODUCTIVITY OF NATURAL GRASSLAND AND PASTURES OF SERBIA AND SRPSKA
<b>10:25-10:35</b> O1_09	Sanja Vasiljević, Zorica Nikolić, Vojislav Mihailović, Snežana Katanski, Dalibor Živanov, Zlatica Mamlić, Vojin Đukić, Ana Uhlarik EFFECT OF CUTTING MANAGEMENT ON SEED YIELD, SEED YIELD COMPONENTS AND SEED QUALITY OF RED CLOVER ( <i>TRIFOLIUM PRETENSE</i> L.)

<b>10:35-10:45</b> O1_10	Snežana Brajević, Aleksandar Simić, Gordana Andrejić, Ružica Stričević, Željko Dželetović, Uroš Aleksić, Slaviša Đorđević <b>THE EFFECTS OF FERTILIZATION TREATMENTS ON PHYTOREMEDIATION PROPERTIES OF TALL FESCUE (<i>FESTUCA ARUNDINACEA</i> SCHREB.)</b>
<b>10:45-11:00</b>	<b>Poster presentations</b> <b>Posters: P1_01 – P1_19</b>
<b>11:00-11:10</b>	<b>Discussion</b>
<b>11:10-11:30</b>	<b>Coffee break</b>

## SESSION 1: CROP SCIENCE 2

### Oral Presentations

The City of Sun'Trebinje Hall 1

### Chair: Sava Vrbničanin, Savo Vučković, Sandra Cvejić

<b>11:30-11:45</b> O1_11	Goran Bekavac, Goran Malidža, Ivica Đalović, Božana Purar, Miroslav Zorić, <b>Invited lecture</b> <b>CTM HYBRIDS – A UNIQUE SOLUTION IN MAIZE PRODUCTION</b>
<b>11:45-11:55</b> O1_12	Miloš Nožinić, Dejan Simić <b>ANALYSIS OF SOYBEAN VARIETAL TRIALS IN 2015 AND 2016 / DANUBE SOYA PROJECT</b>
<b>11:55-12:05</b> O1_13	Desimir Knežević, Aleksandra Yu. Novoselskaya-Dragovich, Aleksandar Paunović, Danijela Kondić, Svetlana Roljević Nikolić, Adriana Radosavac, Tomislav Brzaković, Mirjana Menkovska <b>VARIATION OF PROTEIN CONTENT IN WHEAT SEED</b>
<b>12:05-12:15</b> O1_14	Sandra Cvejić, Siniša Jocić, Milan Jocković, Boško Dedić, Sonja Gvozdenac, Aleksandra Radanović, Ankica Kondić Špika, Ana Marjanović Jeromela, Dragana Miladinović <b>ADVANCED PHENOTYPING TECHNIQUES IN SUNFLOWER BREEDING</b>
<b>12:15-12:25</b> O1_15	Muftah Krayem <b>STUDY OF THE AMINO ACID CONTENT OF TRITICALE TO COMPARE WITH OTHER CEREAL CROPS GENOTYPE</b>
<b>12:25-12:35</b> O1_16	Sonja Gvozdenac, Željko Milovac, Sandra Cvejić, Jelena Ovuka, Dragana Miladinović, Siniša Jocić, Miloš Krstić <b>ARE DROUGHT AND PRECIPITATION PATTERNS AFFECTING SUNFLOWER SUSCEPTIBILITY WIREWORMS?</b>
<b>12:35-12:45</b> O1_17	Jernej Jakše, Ajay Kumar Mishra, Jaroslav Matoušek, Tanja Guček, Nataša Štajner, Sebastjan Radišek <b>CBCVD VIROID THREAT TO EUROPEAN HOP PRODUCTION</b>

<b>12:45-12:55</b> O1_18	Andrej Sečnik, Nataša Štajner, Sebastjan Radišek, Mitja Križman, Jernej Jakše CYTOSINE METHYLATION IN GENOMIC DNA AND IDENTIFICATION OF DNA METHYLASES AND DEMETHYLASES IN VIROID-INFECTED HOP PLANTS ( <i>HUMULUS LUPULUS</i> VAR. 'CELEIA')
<b>12:55-13:20</b>	<b>Poster presentations: P1_20 – P1_40</b>
<b>13:20-13:30</b>	<b>Discussion</b>

<b>SESSION 2: HORTICULTURE 1</b>	
<b>Oral Presentations</b>	The City of Sun'Trebinje Hall 2
<b>Chair: Sanja Radonjić, Dragoslav Ivanišević, Miljan Cvetković</b>	
<b>09:00-09:15</b> O2_01	Dragoslav Ivanišević, Mladen Kalajdžić, Predrag Božović, Dragan Milošević, <b>Invited lecture</b> THE RESPONSE OF GRAPEVINE CULTIVARS TO CLIMATE CHANGE
<b>09:15-09:25</b> O2_02	Darko Jaksic, Mirjam Vujadinovic Mandic, Ana Vukovic Vimic, Ivan Bradic, Jordana Ninkov, Bojan Mandic, Veljko Perovic PROKUPAC VINE VARIETY – IN EXPECTATION OF CLIMATE CHANGES
<b>09:25-09:35</b> O2_03	Katarina Rudolf Pilih, Nataša Štajner, Jana Murovec, Borut Bohanec, Jernej Jakše RAPID BREEDING OF NEW CABBAGE ( <i>BRASSICA OLERACEA</i> VAR. <i>CAPITATA</i> L.) HYBRID VARIETIES
<b>09:35-09:45</b> O2_04	Sanja Lazić, Dragana Šunjka, Slavica Vuković, Dragana Bošković, Aleksandra Šušnjar, Antonije Žunić DISSIPATION AND RESIDUES OF EMAMECTIN BENZOATE IN PAPRIKA
<b>09:45-09:55</b> O2_05	Milan Adamović, Mirjana Stojanović, Aleksandra Bočarov Stančić, Muhamed Harbinja, Jasmina Kustura INFLUENCE OF NATURAL AND ENRICHED PYROPHYLLITE ON ONION YIELD ( <i>ALLIUM CEPA</i> )
<b>09:55-10:05</b> O2_06	Milena Lakićević, Anja Đoković INVASIVE SPECIES IN THE OLD PARK IN TEMERIN (SERBIA)
<b>10:05-10:15</b>	<b>Discussion</b>
<b>10:15-11:30</b>	<b>Poster presentations:P2_01 – P2_26</b>
<b>11:30-12:00</b>	<b>Coffee break</b>



<b>SESSION 2: HORTICULTURE 2</b>	
<b>Oral Presentations</b>	The City of Sun'Trebinje Hall 2
<b>Chair: Dragana Šunjka, Ivana Glišić, Miljan Cvetković</b>	
<b>12:00-12:15</b> O2_07	Maria João Carvalho, Silvina Ferro Palma, <b>Invited lecture</b> OLIVE OIL SENSORY QUALITY
<b>12:15-12:25</b> O2_08	Sanja Radonjić, Snježana Hrnčić NON-EU FRUIT FLIES SERIOUS THREAT FOR EUROPEAN FRUIT PRODUCTION
<b>12:25-12:35</b> O2_09	Mišaela Vakić, Duška Delić, Mariana Mihaljica, Amer Sunulahpašić, Janis Tzanetakis BLUEBERRY LATENT VIRUS IN HIGHBUSH BLUEBERRY ( <i>VACCINIUM CORYMBOSUM</i> L.) IN BOSNIA AND HERZEGOVINA
<b>12:35-12:45</b> O2_10	Slavica Vuković, Dragana Šunjka, Sanja Lazić, Antonije Žunić, Dragana Bošković, Miloš Petrović CONTROL OF <i>CYDIA POMONELLA</i> L. IN APPLE ORCHARDS USING SPINETORAM, PYRIPROXYFEN AND CHLORANTRANILIPROLE
<b>12:45-12:55</b> O2_11	Biljana Lolić, Biljana Radusin Sopić, Jelena Nikitović, Marina Antić, Tatjana Milaković REVIEWING THE PROGRESS AND MEASURES FOR CONTROL OF <i>PHYTOPHTHORA FRAGARIAE</i> VAR. <i>RUBI</i>
<b>12:55-13:05</b> O2_12	Vanja Miljanić, Denis Rusjan, Andreja Škvarč, Philippe Chatelet, Nataša Štajner ELIMINATION OF GRAPEVINE VIRUSES AND VIROIDS THROUGH IN VIVO THERMOTHERAPY AND IN VITRO MERISTEM TIP MICROGRAFTING
<b>13:05-13:15</b>	<b>Discussion</b>
<b>13:15-13:45</b>	<b>Poster presentations</b> <b>Posters: P2_27 – P2_48</b>
<b>SESSION 3: AGRICULTURAL ECONOMICS AND RURAL DEVELOPMENT</b>	
<b>Oral Presentations</b>	The City of Sun'Trebinje Hall 3
<b>Chair: Željko Vaško, Stanislaw Minta, Nebojša Novković</b>	
<b>09:00-09:10</b> O3_01	Gordana Rokvić Knežić, Ljiljana Drinić EUROPEAN GREEN AGENDA AND IMPLICATIONS FOR AGRICULTURE AND RURAL DEVELOPMENT POLICY OF BOSNIA AND HERZEGOVINA
<b>09:10-09:20</b> O3_02	Željko Vaško IMPACT OF THE COVID-19 PANDEMIC ON AGRICULTURE AND FOOD SUPPLY – EVIDENCE FROM THE REPUBLIC OF SRPSKA

<b>09:20-09:30</b> O3_03	Leila Šeper FOOD FOR FUTURE - CONSUMER PERSPECTIVE
<b>09:30-09:40</b> O3_04	Stanislaw Minta, Jerzy Koronczok INTEREST OF POLISH FARMERS IN WATER AND DRAINAGE INVESTMENTS – SELECTED RESULTS OF THE INOMEL PROJECT
<b>09:40-09:50</b> O3_05	Vesna Mrdalj, Aleksandar Ostojić, Željko Vaško EXPORT COMPETITIVENESS OF MILK AND DAIRY PRODUCTS OF REPUBLIC OF SRPSKA ON THE INTERNATIONAL MARKET
<b>09:50-10:00</b> O3_06	Nebojša Novković, Beba Mutavdžić, Nataša Vukelić, Blagoje Paunović, Veljko Šarac ANALYSIS AND FORECASTING OF FRUIT PRICES IN SERBIA
<b>10:00-10:10</b> O3_07	Natalia Jędroszka FISH MARKET ANALYSIS WITH PARTICULAR EMPHASIS ON THE RECIRCULATING AQUACULTURE SYSTEM (RAS)
<b>10:10-10:20</b> O3_08	Nemanja Jalić, Aleksandar Ostojić, Vesna Mrdalj EXTERNAL PRICE PARITIES OF WHEAT AND MAIZE IN THE REPUBLIC OF SRPSKA
<b>10:20-10:30</b> O3_09	Rafal Ramut THE ECONOMIC SIGNIFICANCE OF BIOSTIMULANTS ON THE EXAMPLE OF ORCHARD PRODUCTION
<b>10:30-10:40</b> O3_10	Zorica Srđević, Ružica Stričević, Bojan Srđević, Aleksa Lipovac CLIMATE CHANGE ADAPTATION MEASURES IN AGRICULTURE: PERSPECTIVE OF DIFFERENT EXPERTS' GROUPS
<b>10:40-10:50</b>	SWG group, Sponsored presentation
<b>10:50-11:00</b>	<b>Discussion</b>
<b>11:00-11:30</b>	<b>Poster presentations: P3_01 – P3_12</b>
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#### SECTION 4: ANIMAL SCIENCES

**Oral Presentations** The City of Sun'Trebinje Hall 3

**Chair: Biljana Rogić, Radica Đedović, Vesna Ganter**

<b>12:00-12:15</b> O4_01	Muhamed Brka, Radica Đedović, Snežana Trivunović, Vesna Gantner, <b>Invited lecture</b> SUSTAINABLE DEVELOPMENT OF LIVESTOCK PRODUCTION IN THE LIGHT OF CLIMATE CHANGE
<b>12:15-12:30</b> O4_02	Vasco Fitas da Cruz, <b>Invited lecture</b> OVERVIEW OF RESEARCH AND EDUCATION ACTIVITIES IN PRECISION LIVESTOCK FARMING

<b>12:30-12:45</b> O4_03	Vesna Gantner, Muhamed Brka, Božo Važić, <b>Invited lecture</b> THE PRECISION TECHNOLOGIES IN LIVESTOCK PRODUCTION
<b>12:45-12:55</b> O4_04	Dragan Stanojević, Radica Đedović, Vladan Bogdanović, Krstina Zeljić Stojiljković, Nikolija Gligović, Ivan Mitrović, Marina Lazarević, Ljiljana Samolovac THE IMPACT OF BREEDING REGION AND LACTATION ON MILK YIELD TRAITS IN THE OF SIMMENTAL CATTLE POPULATION OF THE REPUBLIC OF SERBIA
<b>12:55-13:05</b> O4_05	Bouhroum Nassima, Bensahli Belmehel HARM TO THE WELL-BEING OF THE UDDER AT THE LEVEL OF DAIRY FARMS OF SIDI MHAMED BENALI WILAYA OF RELIZANE (ALGERIA)
<b>13:05-13:15</b> O4_06	Biljana Rogić, Ljuba Štrbac, Slađana Preradović, Božo Važić PHENOTYPIC DESCRIPTION OF THE LIPICANE HORSES POPULATION FROM BOSNIA AND HERZEGOVINA AND SERBIA
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<b>13:25-14:10</b>	<b>Poster presentations: P4_01 – P4_21</b>
	<b>ROUND TABLE</b>
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<b>15:30-17:30</b>	<b>Future of education on agricultural faculties in Balkan countries</b>
	<b>Chair: to be unounced</b>
	<b>XXVII SAVJETOVANJE INŽINJERA POLJOPRIVREDE REPUBLIKE SRPSKE</b>
	Stručno savjetovanje na temu: <b>ORGANSKA POLJOPRIVREDA – SADAŠNJE STANJE I TENDENCIJE RAZVOJA</b>
	<b>Oral presentations</b>
	The City of Sun'Trebinje Hall 2
	<b>Moderator: Vida Todorović i Stoja Jotanović</b>
<b>16:00–16:05</b>	Pozdravna riječ: Zlatan Kovačević, Siniša Mitrić
<b>16:05 –16:25</b>	Dragana Zec SADAŠNJE STANJE I PERSPEKTIVE RAZVOJA ORGANSKE POLJOPRIVREDE I ZAKONSKA REGULATIVA
<b>16:25- 16:45</b>	Željko Dolijanović POSEBNI (ALTERNATIVNI) SISTEMI GAJENJA U ORGANSKOJ POLJOPRIVREDI (PLODORED, ZDRUŽENI I POKROVNI USEVI)
<b>16:45-17:05</b>	Vida Todorović OSNOVNI PRINCIPI ORGANSKE PROIZVODNJE POVRĆA

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<b>17:05-17:25</b>	Stoja Jotanović SPECIFIČNOSTI ANIMALNE ORGANSKE PROIZVODNJE
<b>17:25-17:45</b>	Grujica Vico SPECIFIČNOSTI MARKETINGA I TRŽIŠTA PROIZVODA U ORGANSKOJ PROIZVODNJI
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## The content of metals and metalloids in bulbs of different genotypes of *Allium* species

Dorđe Moravčević<sup>1</sup>, Marko Krstić<sup>2</sup>, Jelica Gvozdanović-Varga<sup>3</sup>, Aleksandar Ž. Kostić<sup>1</sup>, Ana Vujošević<sup>1</sup>, Sofija Kilibarda<sup>1</sup>, Sandra Vuković<sup>1</sup>

<sup>1</sup>University of Belgrade, Faculty of Agriculture, Zemun, R. Serbia

<sup>2</sup>University of Belgrade, Faculty of Pharmacy, Belgrade, R. Serbia

<sup>3</sup>Institute of Field and Vegetable Crops, Novi Sad, R. Serbia

Corresponding author: Dorđe Moravčević, [djordje.moravcevic@gmail.com](mailto:djordje.moravcevic@gmail.com)

### Abstract

In this research, we examined the effect of 15 genotypes of selected *Allium* species: *A. sativum* L. (10 genotypes), *A. ampeloprasum* L. var. *ampeloprasum* (3) and *A. cepa* L. (2), on the content of metals and metalloids in bulbs. Determination of the content of elements was performed using the method of atomic absorption spectroscopy and ICP-OES method (mg/kg of dry matter). This research found that all tested genotypes differed statistically significantly in the content of Na, K, Ca and Mg both from each other and within the species. The highest content of Na, K, Ca and Mg was established in *A. sativum*, while the lowest content were observed in onion (*A. cepa*). Genotypes of *A. ampeloprasum* var. *ampeloprasum* contained moderate amounts of Na, K, Ca and Mg. The content of certain metals was the same in all genotypes of the tested *Allium* species and was < 0.01 mg/kg (Hg) and < 0.5 mg/kg (Hg, Co, Ni and Mo). The species *A. ampeloprasum* var. *ampeloprasum* showed the highest affinity for Cd accumulation in bulbs, followed by *A. sativum* and *A. cepa*. According to the content of Fe and Zn, *Ljubičasti sredbrenjak* as onion variety, it stood out in relation to all genotypes of tested *Allium* species. The highest content of Cd, Mn and Se was noticed in genotypes of *A. ampeloprasum* var. *ampeloprasum*. The presence of potentially toxic elements (Pb, Hg, As) was also determined in the bulbs of tested species, but in the safe levels. Considering the fact that species of the genus *Allium* show the ability to accumulate elements that are important for human health, especially Fe, Zn and Se, future research should be directed to enriching popular species from this genus with these elements by applying simple and cost effective agrotechnical measures, such as biofortification.

*Key words:* *Allium* species, genotypes, metals, metalloids