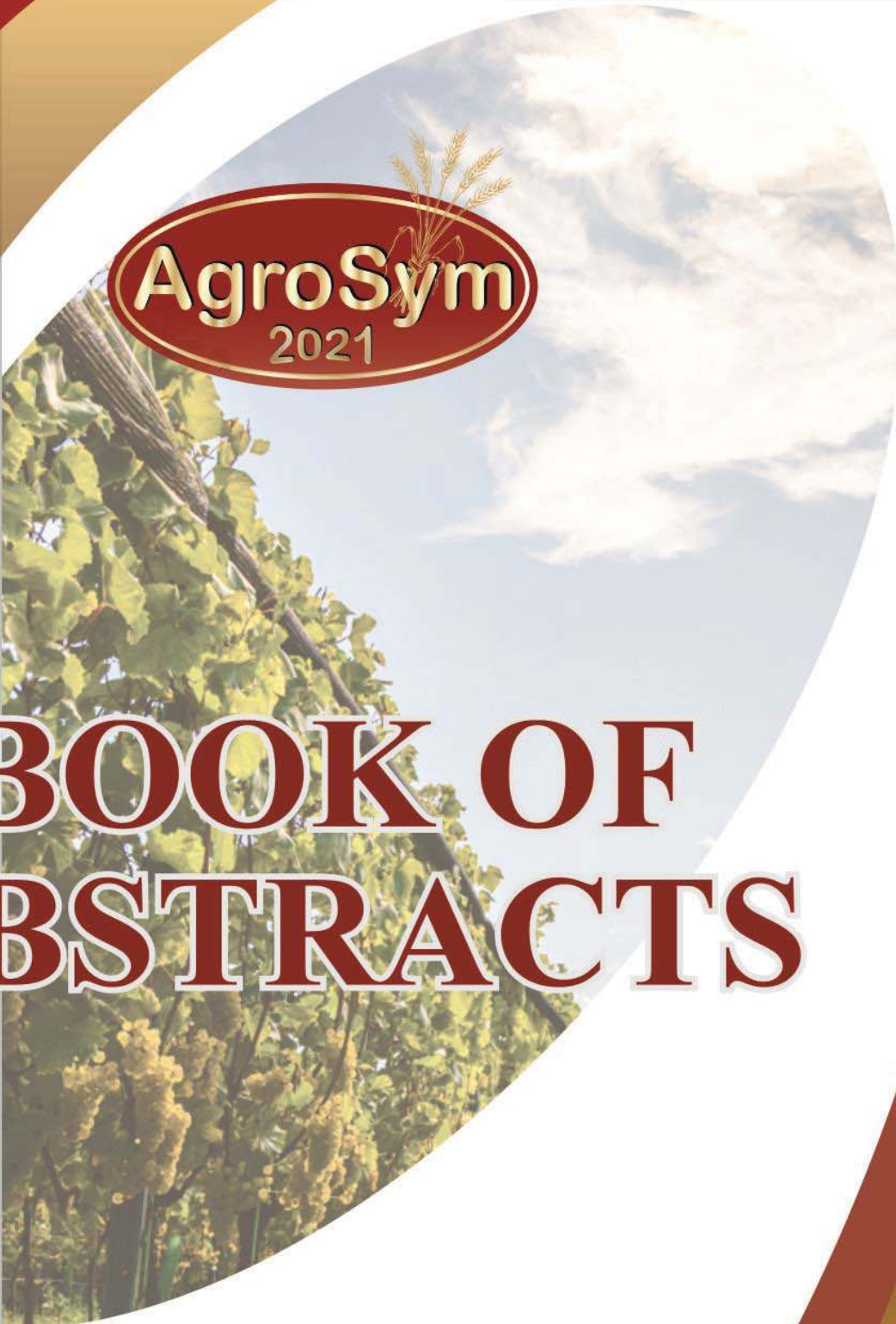




AgroSym
2021



BOOK OF ABSTRACTS

*XII International Scientific
Agriculture Symposium
"AGROSYM 2021"
October 7-10, 2021*



AGRO 2021
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**XII International Scientific Agriculture Symposium
“AGROSYM 2021”**



Jahorina, October 07 - 10, 2021

Impressum

XII International Scientific Agriculture Symposium „AGROSYM 2021“

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
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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 2021" (12 ;
Jahorina)

Book of Abstracts [Електронски извор] / XII International Scientific
Agriculture Symposium "Agrosym 2021", Jahorina, October 07 - 10, 2021 ;
[editor in chief Dušan Kovačević]. - East Sarajevo = Istočno Sarajevo :
Faculty of Agriculture = Poljoprivredni fakultet, 2021. - 1 електронски
оптички диск (CD-ROM) : текст, слика ; 12 cm

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

ISBN 978-99976-787-8-2

COBISS.RS-ID 134426625

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PREFACE

Dear colleagues,

In your hands is the Book of Abstracts of the 12th International Scientific Agricultural Symposium "AGROSYM 2021", which I hope you will find useful in your work. As many as 700 contributions have been accepted for the Book of Abstracts. The themes of AGROSYM 2021 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.

The multi-functionality of agriculture (viz. crop production, animal production and fisheries) and the central role it plays in food production, food security, rural development, bio-economy (e.g. production of fibres and raw materials for industries) and green economy (e.g. production of biofuels) determine its importance in all countries; especially nowadays, with the second year of the COVID-19 pandemic.

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

While the focus has been in the past on the production side (cf. productivity, efficiency), more and 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 than ever before about what they want on their tables i.e. higher quality as well as healthier, safer, and tastier products. Therefore, most companies in the food industry are currently exploring different ways to ensure that they have more control over the production processes for agricultural commodities as well as final products quality. Changes in investment strategy also have the potential to reduce the environmental and social costs of agriculture. It is now apparent to most investors that companies that pay more attention to sustainability and social responsibility, even with the same financial rating, will have better returns both in the short term and over time.

Agri-food systems have been central in the global debate on sustainable development and the achievement of the Sustainable Development Goals (SDGs) as shown by the recent United Nations' Food Systems Summit held in September 2021 in New York. 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 create farming systems that mitigate or eliminate environmental harms associated with industrial agriculture.

Many thanks to all the authors, reviewers and colleagues for their help 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 2021

Prof. Dušan Kovačević, PhD

Editor in Chief, President of the Scientific Committee of AGROSYM 2021



CONTENT

KEYNOTE PAPERS	75
REDEFINING THE COMPETITIVE IDEOTYPE OF A MODERN CROP VARIETY: AGRONOMY AND BREEDING PERSPECTIVES	
Ioannis TOKATLIDIS	76
FACTORS DRIVING RECENT AND PROJECTED DEVELOPMENTS IN WORLD AGRICULTURAL MARKETS	
Patrick WESTHOFF	77
CUTTING-EDGE CROP BREEDING WITH CRISPR-CAS GENOME EDITING TECHNOLOGIES	
Yiping QI	78
1. PLANT PRODUCTION.....	79
EFFECT OF WATER STRESS ON THE BEHAVIOR OF SIX DURUM WHEAT GENOTYPES IN A SEMI-ARID REGION OF WESTERN ALGERIA	
Fetati AICHA.....	80
PHYSICO-CHEMICALSTUDY AND ANTIOXIDANTACTIVITY OF FIVE ALGERIAN HONEY SAMPLES	
Nabila BRAHMI	81
GENETIC STRUCTURE OF BARLEY (HORDUM VULGARE L.): ACCESSION COLLECTIONS FROM ALGERIA	
Warda TAIBÍ, Fatima HENKRAR, Sripada MAHABALA UDUPA, Suheil BECHIR SEMIR GAOUAR.....	82
COMPARATIVE STUDY OF KERNEL TRAITS AMONG THE DIFFERENT WHEAT- ALIEN AMPHIPLOIDS IN CONDITIONS OF ABSHERON PENINSULA	
Rahim RAHIMOV, Mehraj ABBASOV, Aybeniz ALIYEVA, Sabina MEHDIYEVA	83
BIOSTIMULANTS FOR ENHANCING PLANT ABIOTIC STRESS TOLERANCE	
Mirza HASANUZZAMAN	84
ENHANCEMENT OF THE CUCUMBER SEEDLING QUALITY THROUGH PRIMING WITH NaCl	
Farjana PARVIN, Homayra AKHTER, Shahnewaz SHARIF, Shamim REZA, Debasish PAUL, Shreef MAHMOOD.....	85
THE INFLUENCE OF FERTILIZATION WITH PYROPHYLLITE ON VEGETATIVE GROWTH OF WHITE HEAD CABBAGE	
Sanid PAŠIĆ, Aleksandra GOVEDARICA-LUČIĆ, Goran PERKOVIĆ.....	86

FUNCTIONAL FOOD - PRODUCTS FROM TOMATO WITH LYCOPENE IN PREVENTION OF CARDIOVASCULAR DISEASES	
Hanadija OMANOVIC, Amna BIJEDIC, Deniz EKINCI.....	87
INFLUENCE OF DIFFERENT FERTILIZATION MODELS ON THE MORPHOLOGY OF GALA SHNIGA APPLE LEAF (Malus domestica L.)	
Dževad LAVIC	88
THE EFFECTS OF MINERAL FEEDING AND LOCATION ON SEED QUALITY OF SEVERAL SORTS OF FORAGE	
Igor ĐURĐIĆ, Vesna MILIĆ, Branka GOVEDARICA, Željko LAKIĆ	89
THE EFFECT OF POLYMER AND LOCATION ON SOME MORPHOLOGICAL CHARACTERISTICS OF POTATO	
Vesna MILIĆ, Branka GOVEDARICA, Igor ĐURĐIĆ, Anđelka POPADIĆ, Igor MILUNOVIĆ...	90
CHEMICAL COMPOSITION OF THE FRUIT OF AUTOCHTHONOUS CULTIVARS OF APPLE FROM SARAJEVO AREA (BOSNIA AND HERZEGOVINA)	
Nedim BADŽAK, Zlatka ALIĆ–DŽANOVIĆ, Mirjana RADOVIĆ, Mirko KULINA, Jasmina ALIMAN.....	91
INFLUENCE OF THE SIZE OF VEGETATION SPACE ON THE QUALITY OF TOMATO SEEDLINGS	
Vida TODOROVIĆ, Svjetlana ZELJKOVIĆ, Nikolina ĐEKIĆ, Dragan ŠVRAKA	92
IMPORTANCE OF BARLEY STEM RESERVES IN STRESS TOLERANCE	
Novo PRŽULJ.....	93
VASE LIFE OF CUT FLOWERS USING DIFFERENT VASE SOLUTION	
Svjetlana ZELJKOVIĆ, Milica PAŠALIĆ, Boris PAŠALIĆ, Emina MLADENOVIĆ	94
GENETIC PARAMETERS AND SELECTION IN ELEPHANT GRASS FOR PRODUCTION AND QUALITY OF BIOMASS BY MIXED-MODELS	
Rogério FIGUEIREDO DAHER, Raiane MARIANI SANTOS, Ana Késia FARIA VIDAL, Wanessa FRANSCESCONI STIDA, Alexandre GOMES DE SOUZA, Rafael SOUZA FREITAS, Maxwell RODRIGUES NASCIMENTO, Josefa GRASIELA SILVA SANTANA, Cleudiane LOPES LEITE, Moisés AMBRÓSIO, Antônio VANDER PEREIRA.....	95
ENERGY FOR DYNAMIC TEARING OF GYNOPHORS OF BULGARIAN PEANUT VARIETIES	
Nayden NAYDENOV, Stoyan ISHPEKOV	96
COMPARATIVE STUDY OF LETTUCE CULTIVARS UNDER OPEN FIELD PRODUCTION	
Shaban NIDAL, I. MITOVA, M. RIZAKOV	97
PLANT GENETIC RESOURCES IN BULGARIA – CONSERVATION AND UTILIZATION	
Katya UZUNDZHALIEVA, Mariya SABEVA, Siyka ANGELOVA	98

EFFECTS OF GAMMA-IRRADIATION ON OXIDATIVE STABILITY AND ANTIOXIDANT ACTIVITY OF WALNUTS

Sabina TANEVA, Dessislava TENEVA, Adriana KAZAKOVA, Iskra TOTZEVA, Zhanina PETKOVA, Mariana NACHEVA, Petko DENEV, Svetlana MOMCHILOVA 99

INFLUENCE OF DIFFERENT ROOTSTOCKS ON THE CONTENT OF BIOLOGICALLY ACTIVE COMPOUNDS IN PLUMS AND PEACHES

Victoria IVANOVA, Boryana TRUSHEVA, Sava TABAKOV, Antoaneta TRENDAFILOVA 100

INFLUENCE OF INTERCROPPING SWEET SORGHUM WITH CLIMBING BEAN ON FORAGE YIELD AND QUALITY

Darko UHER, Zlatko SVEČNJAK, Zvonko PACANOSKI, Dubravka DUJMOVIĆ-PURGAR, Martina KOVAČEVIĆ, Ivan HORVATIC 101

EFFECT OF FOLIAR SPRAY OF AMMONIUM NITRATE AND IRRIGATION TIME ON VEGETATIVE GROWTH, FRUIT SET, YIELD AND FRUIT QUALITY OF "EWAIS" MANGO TREES

M. M. M. ABD EL-MIGEED, E. ABD EL-RAZEK; Hassan A. M. ALI, N. ABDEL-HAMID 102

CO-ADDITION OF POTASSIUM HUMATE AND VINASSE ENHANCES GROWTH AND YIELD IN "WONDERFUL" POMEGRANATE UNDER SANDY SOIL

Hassan A. M. ALI, Emad ABD EL-RAZEK, Mahmoud M.M. ABD EL-MIGEED, Fatma El-Zahraa M. GOUDA..... 103

EFFECT OF DIFFERENT WEED CONTROL PRACTICES ON YIELD OF SESAME CROP

Rady, M. O. A.; H. MAHFOUZ; A. EKRAM MEGAWER, F.S. ABD EL-SAMIE 104

OPTIMISATION OF THE SUBSTRATE FOR THE CULTIVATION OF OYSTER MUSHROOMS (*PLEUROTUS OSTREATUS*) USING COFFEE GROUNDS AND BY-PRODUCT FROM BREWERIES

M. CRANIER, M. KOCH, E. OGANESSOVA, A. SMITH, T. DE OLIVIERA, Ludovic ANDRES 105

SWEET POTATO ROOT SYSTEM UNDER VARIOUS CULTIVATION TECHNIQUES

Emanuel JAUFMANN, Kurt-Jürgen HÜLSBERGEN, Harald SCHMID..... 106

DEVELOPMENT OF A WEB-BASED FARM-NUTRIENT-MANAGEMENT-SYSTEM: REQUIREMENTS AND MODEL STRUCTURE

Joseph DONAUER, Marco LUTHARDT, Frank LEßKE, Kurt-Jürgen HÜLSBERGEN 107

INFLUENCE OF BLUE AND RED LEDs ON DEVELOPMENT AND NUTRITIVE VALUE OF *PERILLA FRUTESCENS* (L.) CULTIVATED IN CLIMATE CHAMBERS

Nikolina GRABOVAC, Michael H. BÖHME 108

BREEDING MAIZE FOR ADAPTATION AT A LOW INPUT FARMING SYSTEM

Chrysanthi PANKOU, Fotakis GEKAS, Fokion PAPATHANASIOU, Foteini PAPADOPOULOU, Athina BIZI, Evaggelia SINAPIDOU, Ioannis TOKATLIDIS 109

MANAGEMENT OF INTRA-CULTIVAR VARIATION IN COTTON

Chrysanthi PANKOU, Athanasios MAVROMATIS, Aphrodite TSABALLA, Ioannis TOKATLIDIS
..... 110

NITROGEN FERTILIZATION'S EFFECT ON THE QUALITY CHARACTERISTICS OF VARIOUS SORGHUM VARIETIES

Dimitrios BARTZIALIS, Kyriakos D. GIANNOULIS K.D., Elpiniki SKOUFOGIANNI E., George CHARVALAS, Nicholas G DANALATOS..... 111

THE EFFECT OF DIRECT USE OF LAKESIDE BIOMASSAS SOIL AMENDMENT ON THE PRODUCTIVITY OF DRY BEAN CROP

Fokion PAPATHANASIOU, Anthousa TZOTZI, Irene KOUTSERI, Myrsini MALAKOU, Theodoros PARISIS, Ioannis PAPADOPOULOS..... 112

SELECTION AT ULTRA-LOW DENSITY OF SECOND GENERATION LINES OF BEAN CULTIVARS UNDER WATER STRESS

Fokion PAPATHANASIOU, Ioannis MYLONAS, Ilias AVDIKOS, Olga PETIDOU, Elisavet NINO, Fotini PAPADOPOULOU, Ioannis PAPADOPOULOS 113

EVALUATION AND SELECTION OF MAIZE GENOTYPES WITHOUT COMPETITION

Fokion PAPATHANASIOU, Chrysanthi PANKOU, Iosif SISTANIS, Michail ORFANOUDAKIS, Evaggelia SINAPIDOU, Ioannis PAPADOPOULOS, Ioannis TOKATLIDIS..... 114

IDENTIFICATION OF POPULATION-NEUTRAL MAIZE HYBRIDS USING PHYSIOLOGICAL TRAITS

Fotis GEKAS, Fokion PAPATHANASIOU, Ioannis TOKATLIDIS 115

GRAIN QUALITY OF OPEN-POLLINATED MAIZE LINES AND HYBRIDS UNDER DROUGHT

Fotis GEKAS, Chrysanthi PANKOU, Fokion PAPATHANASIOU, Foteini PAPADOPOULOU, Iosif SISTANIS, Evaggelia SINAPIDOU, Ioannis TOKATLIDIS 116

GRAIN QUALITY OF OPEN-POLLINATED MAIZE LINES AND HYBRIDS UNDER DROUGHT

Fotis GEKAS, Chrysanthi PANKOU, Fokion PAPATHANASIOU, Foteini PAPADOPOULOU, Iosif SISTANIS, Evaggelia SINAPIDOU, Ioannis TOKATLIDIS 117

SELECTING MAIZE GENOTYPES UNDER TWO INPUT SYSTEMS BASED ON PHYSIOLOGICAL TRAITS AND SEED YIELD

Iosif SISTANIS, Chrysanthi PANKOU, Fotakis GEKAS, Foteini PAPADOPOULOU, Ioannis PAPADOPOULOS, Ioannis TOKATLIDIS, Fokion PAPATHANASIOU 118

EVALUATION OF GREEK RYE (*SECALE CEREALE* L.) ACCESSIONS

Iosif SISTANIS, Ioannis MYLONAS, Elisavet NINO, Parthenopi RALLI, Theano LAZARIDOU, Fokion PAPATHANASIOU 119

PHOSPHORUS FERTILIZATION EFFECT ON *VICIA FABAYIELD* AND PROTEIN CONTENT

Dimitrios BARTZIALIS, Kyriakos D. GIANNOULIS, Elpiniki SKOUFOGIANNI, George CHARVALAS, Nicholaos G. DANALATOS 120

COMPARISON OF TWO COMMERCIAL KITS FOR *ZEA MAYS* ROOT DNA EXTRACTION

Louloudia KOULYMPOUDI, George KONTOURIS, Pavlina ALEXANDRIDOU, Nikolaos PARISSIS, Chrysa MITAKIDOU, Athanasios ZAMANIS, Evangelos KARAGEORGOS, Evangelos PANTOULIS, Nikolaos STAMATIS, Anastasios TSAKALAKIS, Konstantina CHARALAMPOUS, Dimitris IOANNOU 121

THE EFFECT OF BIOSTIMULANT APPLICATION ON LETTUCE GROWTH PARAMETERS

Spyridon A. PETROPOULOS, Christina CHASKI 122

RESPONSE OF PUMPKIN GENOTYPES TO DROUGHT STRESS AT GERMINATION STAGE

Spyridon A. PETROPOULOS, Chrysa FOTI, Ourania PAVLI 123

GERMINATION PROFILING OF PUMPKIN GENOTYPES UNDER SALINITY STRESS

Spyridon A. PETROPOULOS, Chrysa FOTI, Ourania PAVLI 124

THE EFFECT OF FERTILIZATION REGIME ON *SCOLYMUS HISPANICUS* PLANT GROWTH

Spyridon A. PETROPOULOS, Nikolaos POLYZOS, Maria COMPOCHOLI 125

SILAGE YIELD AND PROTEIN CONTENT OF FORAGE LEGUMES INTERCROPPING WITH CEREALS IN TWO SPATIAL ARRANGEMENTS

Konstantinos GENNATOS, Theano B. LAZARIDOU 126

EVALUATION OF GREEK BREAD AND DURUM WHEAT CULTIVARS FOR DROUGHT TOLERANCE USING POLYETHYLENE GLYCOL

Maria KARAGIANNI, Maria MOSCHOU, Theano B. LAZARIDOU 127

PEANUT RESPONSE TO PLANTING PATTERN AND ROW SPACING

Vasileios LIAKOS, Panagiotis VIRLAS, Maria KOKORA, Dimitris KALFOUNTZOS 128

COMPARISON COMPOSITION OF LAVENDER AND LAVANDIN VOLATILES CULTIVATED IN KASHMIR HIMALAYAS WHICH HAVE POTENTIAL TO BE VERSATILE INDUSTRIAL CROPS OF THE REGION

S. A.GANGOO, A. R. MALIK, P. ISHTIAK, A. SINGH 129

EFFECT OF HUMIC ACID AND FULVIC ACID ON THE YIELD AND SUGAR YIELD OF SUGAR BEET

Alireza GHAEMI, Rabieh JULIDEH 130

GROWTH PARAMETER RESPONSE OF QUINOA TO NITROGEN FERTILIZER UNDER HIGH SALINITY LEVELS

Asghar RAHIMI, Raheleh AFSHARMANESH, Seyyed Rasoul SAHHAFI, Masoumeh SALEHI 131

COMPARISON OF THE EFFECT OF BIO AND NON-BIO-FERTILIZERS ON YIELD AND ESSENTIAL OIL OF *THYMUS VULGARIS* L.

Farideh GOSHASBI, Mostafa HEIDARI, Seyed Kazem SABBAGH, Hassan MAKARIAN, Seyyed Mohammad taghi TABATABAI 132

THE GENETIC DIVERSITY AND MOLECULAR MAPPING OF ROOT TRAITS IN DURUM WHEAT

Ghasemali NAZEMI , Marco MACCAFERRI, Silvio SALVI, Roberto TUBEROSA, Gita DEHGHANI , Sahba NAZEMI 133

THE EFFECT OF *PSEUDOMONAS SP* AND *SERRATIA MARCESCENS* ON THE ALTERATION OF SEPIOLITE UNDER SALINITY STRESS

Reyhaneh NEJADASADI, Isa ESFANDIARPOUR-BOROJENI, Mohsen HAMIDPOUR, Peyman ABBASZADEH-DAHAI, Seyed Javad HOSSEINIFARD 134

FARMERS' VIEWPOINTS REGARDING TRANSPLANTING VEGETABLE SEEDLINGS: THE CASE OF SOUTHWEST IRAN

Masoumeh FOROUZANI, Gholamreza MAHLAGHA, Masoud BARADARAN 135

FARMERS' SUBJECTIVE WELL-BEING UNDER DROUGHT CONDITION: A COMPARISON BETWEEN DIFFERENT CULTIVATION SYSTEMS

Masoumeh FOROUZANI, Ali SALEHNEJAD, Masoud YAZDANPANA, Marzieh KESHAVARZ 136

EFFECTS OF GAMMA IRRADIATION ON ESSENTIAL OIL OF *SATUREJA HORTENSIS* L.

Mehdi MOHEBODINI, Neda TARIVERDIZADEH 137

CHEMICAL ANALYSES OF THE ESSENTIAL OILS AND ANTIOXIDANT ACTIVITY FROM *SATUREJA HORTENSIS* L. ACCESSIONS FROM EUROPE AND ASIA

Mehdi MOHEBODINI, Roghayeh FATHI..... 138

GRAPHIC ANALYSIS OF DROUGHT TOLERANCE IN DURUM WHEAT GENOTYPES USING STRESS SELECTION INDICES

Gohar AFROOZ, Naser SABAGHNIA, Rahmatollah KARIMIZADEH, Fariborz SHEKARI..... 139

THE EVALUATION OF SEVERAL MINERAL FERTILIZERS' TYPES ON MAIZE TRAITS

Abbas REZAEI, Mohsen JANMOHAMMADI, Naser SABAGHNIA 140

INVESTIGATION OF NANO AND BIO FERTILIZERS ON YIELD AND YIELD COMPONENTS OF MAIZE UNDER LIMITED IRRIGATION

Sirous SADEGHI , Mohsen JANMOHAMMADI, Naser SABAGHNIA..... 141

EFFECT OF COLD PLASMA, SEED COAT SALICYLIC ACID NANO-FORMULATION ON SOME PHYSIOLOGICAL TRAITS OF <i>SALVIA LERIFFOLIA</i> BENTH. SEED	
Seyedeh Mansoureh GHODSIMAAB, Hassan MAKARIAN ¹ , Ziba GHASIMI HAGH, Manoochehr GHOLIPOUR ¹	142
POMOLOGICAL PROPERTIES OF SOME IRANIAN PLUM (<i>PRUNUS DOMESTICA</i>) CULTIVARS	
Yahya SELAHVARZI, Fatemeh NADALIZADEH, Masoud TAGHIZADEH, Malihe MORSHEDLOO	143
THE FIRST RECORD OF ASCOCHYTA BLIGHT ON JASMINE PLANTS (ARABIAN JASMINE) IN MOSUL-IRAQ	
Nadeem AHMED RAMADAN	144
EFFECTS OF DIFFERENT AUXIN (IBA) CONCENTRATIONS ON ROOTING OF COMMON LANTANA (<i>LANTANA CAMARA</i>) AND ABELIA (<i>ABELIA X GRANDIFLORA</i>) CUTTINGS.	
Danilo LOCONSOLE, Barbara DE LUCIA, Giuseppe CRISTIANO.....	145
INFLUENCE OF AGRONOMIC TECHNIQUES ON QUANTITATIVE AND QUALITATIVE PRODUCTION OF ESSENTIAL OILS OF SOME OFFICINAL SPECIES	
Davide FARRUGGIA, Mario LICATA, Salvatore LA BELLA, Teresa TUTTOLOMONDO	146
CHASING DROUGHT STRESS IN LPA1-1 MAIZE MUTANT: EVALUATION OF THE ROOT SYSTEM ARCHITECTURE AND PHOTOSYNTHETIC PARAMETERS	
Federico COLOMBO, Greta BERTAGNON, Michele PESENTI, Roberto PILU.....	147
<i>OPUNTIA FICUS-INDICA</i> (L.) MILLER AS A SUSTAINABLE SOURCE FOR NATURAL DYES PRODUCTION	
Maria MAISTO, Pierpaolo SCARANO, Daniele NAVIGLIO, Antonello PRIGIONIERO, Maria TARTAGLIA, Alessia POSTIGLIONE, Maria Antonietta RANAUDA, Daniela ZUZOLO, Rosaria SCIARRILLO, Carmine GUARINO	148
WHY CONSUMERS PREFER GREEN FRIARIELLO PEPPER: CHANGES IN THE PROTEIN AND METABOLITE PROFILES ALONG THE RIPENING	
Maria TARTAGLIA, Rosaria SCIARRILLO, Daniela ZUZOLO, Angela AMORESANO, Anna ILLIANO, Gabriella PINTO, Jesús V. JORRÍN-NOVO, Carmine GUARINO.....	149
DEVELOPMENT OF NEW VARIETIES OF <i>CAMELINA SATIVA</i> THROUGH BREEDING PROGRAMS BASED ON PURE LINE METHOD AND BULK METHOD	
Martina GHIDOLI, Matteo DELL'ANNO, Elena CASSANI, Stefano SANGIORGIO, Davide REGINELLI, Luciana ROSSI, Filippo GEUNA, Roberto PILU.....	150
GENETIC IMPROVEMENT OF <i>CUCURBITA MAXIMA</i> FOR CAROTENOIDS CONTENT	
Martina GHIDOLI, Stefano SANGIORGIO, Letizia GIGLIOTTI, Helga CASSOL, Alessio SEPULCRI, Davide REGINELLI, Patrizia RISO, Roberto PILU.....	151

SALINITY TOLERANCE OF ITALIAN TRADITIONAL CEREAL VARIETIES Mauro ROSCINI, Silvia DEL VECCHIO, Edy FANTINATO, Gabriella BUFFA	152
MORPHOLOGICAL AND PRODUCTIVE CHARACTERIZATION OF SEVEN ACCESSIONS OF <i>CAPPARIS SPINOSA</i> L. SUBSP. <i>RUPESTRIS</i> IN LINOSA ISLAND IN ITALY Nicolò IACUZZI, Mario LICATA, Salvatore LA BELLA, Teresa TUTTOLOMONDO, Davide FARRUGGIA	153
PHYTOCHEMICAL CHARACTERIZATION OF STRAWBERRY TREE (<i>ARBUTUS UNEDO</i> L.) LEAVES AND FRUIT EXTRACTS AT VARIOUS RIPENESS Pierpaolo SCARANO, Antonello PRIGIONIERO, Alessia POSTIGLIONE, Maria MAISTO, Maria Antonietta RANAUDA, Maria TARTAGLIA, Daniela ZUZOLO, Carmine GUARINO, Rosaria SCIARRILLO	154
THE SOCIAAALP PROJECT: REINTRODUCTION OF RYE AND WHEAT IN ANTRONA VALLEY BY VARIETAL COMPARISON Gianni LICHERI, Nicolò FRANGUELLI, Federico COLOMBO, Martina GHIDOLI, Matteo DELL'ANNO, Stefano SANGIORGIO, Elena CASSANI, Luciana ROSSI, Roberto PILU.....	155
CHEMICAL COMPOSITION OF GRAIN (<i>SORGHUM BICOLOR</i> L. MOENCH) UNDER EFFECT ON PLANT DENSITY AND NITROGEN APLICATION Muftah KRAYEM.....	156
EFFECT OF REDUCED TILLAGE, STRAW AND GREEN MANURE INCORPORATION ON WINTER WHEAT GRAIN QUALITY Aušra SINKEVIČIENĖ, Vaclovas BOGUŽAS, Vaida STEPONAVIČIENĖ, Lina SKINULIENĖ, Alfredas SINKEVIČIUS.....	157
LONG-TERM SOIL STABILITY REFLECTED BY COMPLEX MEASURES Vaida STEPONAVIČIENĖ, Vaclovas BOGUŽAS, Lina SKINULIENĖ, Aušra SINKEVIČIENĖ, Alfredas SINKEVIČIUS.....	158
EFFECT OF LIGHT PHOTOPERIOD ON GROWTH AND PHOTOSYNTHETIC INDICES OF KALE SEEDLINGS Viktorija VAŠTAKAITĖ-KAIRIENĖ, Kristina LAUŽIKĖ, Giedrė SAMUOLIENĖ, Sigita JURKONIENĖ.....	159
BIOFORTIFICATION OF MUSTARD MICROGREENS WITH IRON THROUGH LIGHTING AND NUTRITION STRATEGIES Viktorija VAŠTAKAITĖ-KAIRIENĖ, Aušra BRAZAITYTĖ, Jurga MILIAUSKIENĖ, Kristina LAUŽIKĖ, Rūta SUTULIENĖ, Pavelas DUCHOVSKIS, Giedrė SAMUOLIENĖ	160
THE EFFECTIVENESS OF PHYSIOLOGICAL METHODS FOR OPTIMIZING WORK ON THE ARRANGEMENT AND RESTORATION OF OAK FORESTS Nina ZDIORUK, Alexandru DASCALIUC, Tudor RALEA, Nicolai PLATOVSCHII	161

VARIABLE COMPONENTS DETERMINING THE PRIMARY RESISTANCE TO EXTREME TEMPERATURES OF THE WHEAT SEEDS REPRODUCED IN THE DIFFERENT CLIMATIC ZONE	
Alexandru DASCALIUC, Tudor RALEA, Nina ZDIORUK	162
SAFFLOWER (<i>CARTHAMUS TINCTORIUS</i> L.) ADAPTABILITY UNDER CHANGING CLIMATE OF PAKISTAN AS A RESILIENT QUALITY OILSEED CROP	
Hassan MUNIR, Fahd RASUL, Muhammad SAJID, Saeed RAUF.....	163
<i>IN VITRO</i> CHARACTERIZATION OF FIXED OIL CONTENTS FROM CALLUS CULTURES OF JOJOBA (<i>SIMMONDSIA CHINENSIS</i> L.)	
Muhammad AKRAM, FAHEEM AFTAB	164
RESPONSE OF FINE RICE (<i>ORYZA SATIVA</i> L.) TO SOIL AND FOLIAR ZINC APPLICATION TO COMBAT ZINC MALNUTRITION	
Muhammad BILAL.....	165
EFFECT OF APPLICATION OF POTASSIUM, ZINC AND BOR ON AS POTENTIAL MODULATORS OF HEAT STRESS IN BT COTTON (<i>GOSSYPIUM HIRSUTUM</i> L.)	
Muhammad SARWAR, Muhammad FARRUKH SALEEM, Najeeb ULLAH, Asjad ALI, Haroon ZAMAN KHAN, Muhammad ASHFAQ WAHID, Muhammad SHAHID.....	166
IDENTIFICATION AND CHARACTERIZATION OF DOF TRANSCRIPTION FACTOR GENE FAMILY IN CASHEW (<i>ANACARDIUM OCCIDENTALE</i>)	
Muhammad SHAFIQ, Maira SHAKEEL, Syed Agha ARMAGHAN ASAD ABBAS, Muhammad HASEEB, Numan ALI, Muhammad SALEEM HAIDER.....	167
INNOVATIVE TRENDS IN VEGETABLE NURSERY PRODUCTION	
Nabeel AHMAD IKRAM, Asif ALI KHAN, Abdul GHAFAR	168
UTILIZATION OF AN AGRO-INDUSTRIAL BY-PRODUCT FOR MICROALGAL BIOMASS PRODUCTION	
Agata PIASECKA, Izabela KRZEMIŃSKA	169
INFLUENCE OF CITRATE NANOPARTICLES ON PHOTOCHEMICAL ACTIVITY, RESISTANCE TO PATHOGENS AND PRODUCTIVITY OF WHEAT	
Hanna HULIAIEVA, Lidiia PASICHNY, Irina TOKOVENKO, Antonina KALINICHENKO, Volodymyr PATYKA, Mykhailo BOHDAN, Mykola PATYKA, Viktor MAKSYN.....	170
THE INFLUENCE OF POTASSIUM FERTILIZATION AND IRRIGATION ON THE VITAMIN AND AMINO ACID CONTENT OF TUBERS OF JERUSALEM ARTICHOKE (<i>HELIANTHUS TUBEROSUS</i> L.)	
Bożena BOGUĆKA, Krzysztof JANKOWSKI.....	171
ESTIMATION OF YIELD LOSSES AT HARVEST FOR AN EARLY SOYBEAN CULTIVAR BY MEANS OF A MATHEMATICAL MODEL	
Krzysztof RĘBILAS, Agnieszka KLIMEK-KOPYRA, Magdalena BACIOR, Tadeusz ZAJĄC....	172

VISCOELASTIC PROPERTIES OF APPLES UNDER VARIOUS MECHANICAL LOADING CONDITIONS Krzysztof GOŁACKI	173
THE INFLUENCE OF POTASSIUM FERTILIZATION AND IRRIGATION ON THE YIELD AND HEALTH STATUS OF JERUSALEM ARTICHOKE (<i>HELIANTHUS TUBEROSUS</i> L.) Bożena BOGUĆKA, Agnieszka PSZCZÓŁKOWSKA, Adam OKORSKI, Krzysztof JANKOWSKI	174
EVALUATION OF GRAPEVINE WATER DYNAMICS BY SAP FLOW AND TRUNK DIAMETER MEASUREMENTS UNDER MEDITERRANEAN CLIMATE Aureliano C. MALHEIRO, Nuno CONCEIÇÃO, Lia-Tânia DINIS, José MOUTINHO-PEREIRA	175
IMPORTANCE OF COFFEE PROCESSING TECHNIQUES ON COFFEE SENSORY PROFILE Dimitrie STOICA, Angela-Stela IVAN, Alina-Mihaela CANTARAGIU	176
INFLUENCE OF SOIL TYPES UPON SEED GERMINATION ON TOMATOES, PEPPERS, EGGPLANTS AND MELONS Gabriela ŞOVĂREL , Marcel COSTACHE, Gicuța SBÎRCIOG, Ion SCURTU, Simona HOGEA, Emilia CENUȘĂ, Mihaela BUZATU, Marius VELEA	177
GENE EXPRETIION IN SUGAR BEET UNDER SALT STRESS Ahmad HUSSEIN, Tatyana KRYUKOVA, Tatyana RUDENKO, Aleksandr MOISEENKO	178
MOLECULAR MARKERS FOR IDENTIFICATION OF GENES OF BREEDING-VALUABLE TRAITS OF <i>BETA VULGARIS</i> L. Arpine NALBANDYAN, Tatyana KRYUKOVA, Tatyana FEDULOVA, Elena VASILCHENKO	179
INVESTIGATION OF THE WAYS OF NEW HYBRID FORMS IN PEACH OBTAINING IN VITRO Irina MITROFANOVA, Nina LESNIKOVA-SEDOSHENKO, Svetlana CHELOMBIT, Olga MITROFANOVA	180
FORMATION OF PEA SEEDLINGS INFLUENCED BY FULVIC ACIDS AND FOLACIN Mariia SUBBOTINA, Katarina KOVACHEVICH	181
FEATURES OF THE REPRODUCTION AND PROPAGATION SYSTEM OF SOME SPECIES OF THE CAMPANULACEAE FAMILY Svetlana SHEVCHENKO, Natalia MIROSHNICHENKO	182
DNA-MARKERS AND GENETIC DIVERSITY OF <i>BETA VULGARIS</i> L. Tatyana KRYUKOVA , Arpine NALBANDYAN	183

CONTENT OF BIOACTIVE COMPOUNDS IN BIOMASS OF NATURAL LAWN OF ARRHENATHERETALIA

Andelka POPADIĆ 184

THE USE OF TRITICALE MALTS IN WORT PRODUCTION

Anja TAUŠAN, Milana PRIBIĆ 185

THE INFLUENCE OF ROOTSTOCK ON WINTER COLD HARDINESS, PRODUCTIVITY AND FRUIT QUALITY OF SWEET CHERRY CULTIVAR 'KORDIA'

Boban ĐORĐEVIĆ, Dejan ĐUROVIĆ, Gordan ZEC, Djordje BOŠKOV 186

EFFECTS OF ROOT PRUNING ON GROWTH CONTROL AND FRUIT QUALITY OF APPLE CULTIVAR 'GALA SHNIGA'

Boban ĐORĐEVIĆ, Dejan ĐUROVIĆ, Gordan ZEC, Vladimir SKOKO 187

EFFECT OF CALCIUM CHLORIDE (CaCl₂) ON THE QUALITY OF APPLE CV 'RED CHIEF' (*Malus × domestica* Borkh.) DURING STORAGE

Boris RILAK, Jelena TOMIĆ, Ivan GLIŠIĆ, Milan LUKIĆ, Žaklina KARAKLAJIĆ-STAJIĆ, Svetlana PAUNOVIĆ, Marijana PEŠAKOVIĆ 188

FOLIAR APPLICATION OF ZINC IN THE PRODUCTION OF RED CLOVER SEED ON ACID SOIL

Dalibor TOMIĆ, Vladeta STEVOVIĆ, Dragan ĐUROVIĆ, Milomirka MADIĆ, Đorđe LAZAREVIĆ, Jasmina KNEŽEVIĆ, Miloš MARJANOVIĆ, Nenad PAVLOVIĆ, Andelka POPADIĆ 189

SCREENING WHEAT ROOT AND SHOOT VARIABILITY AT SEEDLING STAGE

Dejan DODIG, Vesna KANDIĆ, Milica BLAŽIĆ, Tomislav ŽIVANOVIĆ 190

VARIABILITY OF GRAIN SPIKE INDEX IN WHEAT (*TRITICUM AESTIVUM* L.)

Desimir KNEŽEVIĆ, Dušan UROŠEVIĆ, Danica MIĆANOVIĆ, Aleksandar PAUNOVIĆ, Danijela KONDIĆ, Vesna ĐUROVIĆ, Adriana RADOSAVAC, Jelica ŽIVIĆ, Mirela MATKOVIĆ STOJŠIN, Milomirka MADIĆ, Veselinka ZEČEVIĆ 191

MORPHOLOGICAL AND PRODUCTION CHARACTERISTICS OF DIFFERENT TOMATO HYBRIDS GROWN IN GREENHOUSES

Jelena PANTOVIĆ, Nenad PAVLOVIĆ, Jasmina ZDRAVKOVIĆ, Sofija KILIBARDA, Stefan GORDANIĆ, Maja SUDIMAC, Slavica JELAČIĆ, Đorđe MORAVČEVIĆ 192

THE IMPORTANCE OF CUCUMBER SEEDLING IRRIGATION BY MEANS OF NUTRIENT SOLUTION

Đorđe MORAVČEVIĆ, Marija ĆOSIĆ, Aleksa LIPOVAC, Sandra VUKOVIĆ, Ana VUJOŠEVIĆ, Nenad PAVLOVIĆ, Milica STOJANOVIĆ 193

IMPACT OF SUBSTRATE VOLUME ON THE CUCUMBER SEEDLING QUALITY

Đorđe MORAVČEVIĆ, Sandra VUKOVIĆ, Ana VUJOŠEVIĆ, Željko DOLIJANOVIĆ, Jelica GVOZDANOVIĆ-VARGA, Stefan GORDANIĆ, Sofija KILIBARDA 194

YIELD OF SWEET PEPPER (*CAPSICUM ANNUUM* L.) DEPENDING ON FERTILIZATION MANAGEMENT

Dorđe VOJNOVIĆ, Žarko ILIN, Vladimir SABADOŠ, Danijela DOROTIĆ-ŽUNIĆ, Boris ADAMOVIĆ, Nataša PRODANOVIĆ..... 195

ANTIOXIDANT ACTIVITY ESTIMATION OF INNER AND OUTER SEED FRACTIONS OF THE LEGUMES *VIGNA RADIATA* L. AND *GLYCINE MAX* L.

Dragana BARTOLIĆ, Miloš PROKOPIJEVIĆ, Ksenija RADOTIĆ 196

CHARACTERIZATION OF COLORED MAIZE SEED FRACTIONS USING FLUORESCENCE SPECTROSCOPY AND MULTIVARIATE ANALYSIS

Dragana BARTOLIĆ, Miloš PROKOPIJEVIĆ, Ksenija RADOTIĆ 197

EFFECT OF DRYING TEMPERATURE ON ANTIOXIDANT ACTIVITY OF WHITE AND RED MAIZE (*ZEA MAYS* L.) SEEDS

Dragana BARTOLIĆ, Miloš PROKOPIJEVIĆ, Branka ŽIVANOVIĆ, Ksenija RADOTIĆ 198

THE INFLUENCE OF THE VARIETY AND DIFFERENT DOSES OF NITROGEN ON THE GRAIN YIELD AND PROTEIN CONTENT IN TRITICALE GRAIN

Milan BIBERDŽIĆ, Dragana LALEVIĆ, Zoran S. ILIĆ, Lidija MILENKOVIĆ, Aleksandar VUKOVIĆ, Saša BARAĆ, Milomirka MADIĆ 199

AZOTOBACTER, PSEUDOMONAS AND BACILLUS ISOLATES STIMULATE THE GERMINATION AND SEEDLING GROWTH OF *MELLISA OFFICINALIS*

Dragana STAMENOV, Simonida ĐURIĆ, Timea HAJNAL JAFARI, Biljana KIPROVSKI, Vladimira SEMAN..... 200

HYBRID × LOCATION INTERACTION IN A MAIZE EARLY TESTING USING FACTOR ANALYTIC APPROACH

Dušan STANISAVLJEVIĆ, Miroslav ZORIĆ, Bojan MITROVIĆ, Milosav BABIĆ, Petar ČANAK, Bojana VUJOŠEVIĆ, Milica PERIŠIĆ, Maja ŠUMARUNA 201

AGRONOMIC PERFORMANCE OF ALMOND CULTIVARS IN SERBIA

Gordan ZEC, Dragan Milatović, Slavica ČOLIĆ, Đorđe BOŠKOV, Boban ĐORĐEVIĆ, Dejan ĐUROVIĆ 202

VARIABILITY OF ZELENY SEDIMENTATION VOLUME IN BREAD WHEAT AND DURUM WHEAT FROM MULTI-ENVIRONMENT TRIAL

Gordana BRANKOVIĆ, Dejan DODIG, Desimir KNEŽEVIĆ, Nenad ĐURIĆ, Sanja VASILJEVIĆ, Irena RADINOVIĆ, Jovan PAVLOV..... 203

EFFICIENCY OF HYDRO- AND OSMOPRIMING IN IMPROVING GARDEN PEA SEED QUALITY AND INITIAL PLANT DEVELOPMENT UNDER SALINE STRESS

Gordana TAMINDŽIĆ, Janko ČERVENSKI, Dragana MILOŠEVIĆ, Zorica NIKOLIĆ, Slobodan VLAJIĆ, Gordana PETROVIĆ, Maja IGNJATOV 204

INTERACTION OF FERTILIZATION AND SOYBEAN GENOTYPE ON NUMBER OF PODS, WEIGHT OF 1000 GRAINS AND GRAIN YIELD

Gorica CVIJANOVIĆ , Vojin ĐUKIĆ , Marija BAJAGIĆ , Nenad ĐURIĆ , Gordana DOZET , Jovana SEKULIĆ, Nenad BOJAT 205

RAMAN SPECTROSCOPIC STUDY OF SUGARS IN SUNFLOWER HONEY SAMPLES FROM ČESTEREG (VOJVODINA, SERBIA)

Ilinka PEĆINAR, Dragana RANČIĆ, Marina MAČUKANOVIĆ-JOCIĆ 206

COULD CARBON DOTS ALLEVIATE COPPER TOXICITY IN MAIZE?

Ivana MILENKOVIĆ, Miroslav NIKOLIĆ, Manuel ALGARRA, Ksenija RADOTIĆ 207

EFFECT OF ORANGE CARBON DOTS ON PHOTOSYNTHETIC PARAMETERS IN MAIZE

Ivana MILENKOVIĆ, Milan BORIŠEV, Yiqun ZHOU, Slađana Z. SPASIĆ, Roger LEBLANC, Ksenija RADOTIĆ..... 208

QUANTITATIVE AND QUALITATIVE CHARACTERISTICS OF WINTER BARLEY IN CONDITIONS OF SOUTHERN SERBIA

Ivica STANČIĆ, Jelica ŽIVIĆ, Milić VOJNOVIĆ, Nemanja STANČIĆ..... 209

FORAGE QUALITY OF PROMISING VETCH GENOTYPES

Jasmina MILENKOVIĆ, Snežana ANĐELKOVIĆ, Jordan MARKOVIĆ, Mirjana PETROVIĆ, Rade STANISAVLJEVIĆ, Dragoslav ĐOKIĆ, Vladimir ZORNIĆ 210

INFLUENCE OF GENOTYPES AND ENVIRONMENT ON EGGPLANT FRUIT LENGTH AND WIDTH

Jelena DAMNJANOVIĆ, Suzana PAVLOVIĆ, Zdenka GIREK, Jelena MILOJEVIĆ, Slađan ADŽIĆ, Tomislav ŽIVANOVIĆ, Milan UGRINOVIĆ 211

BIOPRIMING: A SUSTAINABLE SUPPORT FOR CROP ESTABLISHMENT

Slavica KEREČKI, Jelena JOVIČIĆ-PETROVIĆ, Igor KLJUJEV, Blažo LALEVIĆ, Vera KARLIČIĆ, Ivana PETROVIĆ, Vera RAIČEVIĆ 212

BLUE LED LIGHT PROMOTES SOMATIC EMBRYOGENESIS FROM THE LATERAL ROOTS SECTIONS OF SPINACH (*SPINACIA OLERACEA* L)

Maja BELIĆ, Snežana ZDRAVKOVIĆ-KORAČ, Suzana PAVLOVIĆ, Suzana ŽIVKOVIĆ, Dragan VINTERHALTER, Dušica ČALIĆ, Jelena MILOJEVIĆ..... 213

SUITABILITY OF FIELD PEA : OAT AND COMMON VETCH : OAT MIXTURES FOR ENSILING

Jordan MARKOVIĆ, Tanja VASIĆ, Mirjana PETROVIĆ, Jasmina MILENKOVIĆ, Filip BEKČIĆ, Đorđe LAZAREVIĆ, Snežana BABIĆ..... 214

EVALUATION OF KANAMYCIN AND CEFOTAXIME EFFECTS ON PROLIFERATION, MORPHOLOGY AND GERMINATION RATE OF SOMATIC EMBRYOS IN *CENTAURIUM ERYTHRAEA* RAFN

Katarina ĆUKOVIĆ, Slađana TODOROVIĆ, Milan DRAGIĆEVIĆ, Ana SIMONOVIĆ, Milica BOGDANOVIĆ	215
STABILITY OF WHEAT CULTIVARS FOR YIELD AND QUALITY COMPONENTS IN DIFFERENT AGROECOLOGICAL CONDITIONS	
Kristina LUKOVIĆ, Vladimir PERIŠIĆ, Veselinka ZEČEVIĆ, Kamenko BRATKOVIĆ, Milivoje MILOVANOVIĆ, Snežana BABIĆ, Snežana ANĐELKOVIĆ	216
EFFECT OF ROOTSTOCKS ON GRAFTING WATERMELON PLANT GROWTH, YIELD AND QUALITY	
Lidija MILENKOVIĆ, Ljubomir ŠUNIĆ, Dragana LALEVIĆ, Zoran S. ILIĆ	217
EXPRESSION ANALYSIS OF COLD INDUCED GENES IN EARLY DEVELOPMENTAL STAGES OF MAIZE	
Manja BOŽIĆ, Dragana IGNJATOVIĆ MICIĆ, Jelena VANČETOVIĆ, Ksenija MARKOVIĆ, Ana NIKOLIĆ	218
ENERGY EFFICIENCY OF THE MINERAL FERTILIZER APPLICATION IN CEREAL PRODUCTION	
Marija GAVRILOVIĆ, Aleksandra DIMITRIJEVIĆ, Zoran MILEUSNIĆ, Rajko MIODRAGOVIĆ, Milan UGRINOVIĆ, Radiša ĐORĐEVIĆ, Dejan CVIKIĆ	219
GERMINATION OF DIANTHUS SEROTINUS SEED ORIGINATING FROM PLANTS PRODUCED BY MICROPROPAGATION	
Marija MARKOVIĆ, Vesna GOLUBOVIĆ-ĆURGUZ	220
EFFECTS OF RED AND FAR-RED LIGHT ON SEED GERMINATION OF PLATANUS × ACERIFOLIA (AITON) WILLD.	
Marija MARKOVIĆ, Mihailo GRBIĆ, Dragana SKOČAJIĆ, Danijela ĐUNISIJEVIĆ-BOJOVIĆ, Marijana MILUTINOVIĆ	221
GERMINATION OF BUDDLEJA DAVIDII FRANCH. SEED EXPOSED TO RED AND FAR-RED LIGHT TREATMENTS	
Marija MARKOVIĆ, Mihailo GRBIĆ, Dragana SKOČAJIĆ, Danijela ĐUNISIJEVIĆ-BOJOVIĆ, Marijana MILUTINOVIĆ	222
GERMINATION OF PAULOWNIA FORTUNEI (SEEM.) HEMSL. SEED AFTER DIFFERENT RED AND FAR-RED LIGHT TREATMENTS	
Marija MARKOVIĆ, Mihailo GRBIĆ, Dragana SKOČAJIĆ, Danijela ĐUNISIJEVIĆ-BOJOVIĆ, Marijana MILUTINOVIĆ	223
GERMINATION OF RUDBECKIA FULGIDA VAR. SULLIVANTII 'GOLDSTURM' SEED UNDER DIFFERENT TREATMENTS	
Marija MARKOVIĆ, Mihailo GRBIĆ, Dragana SKOČAJIĆ, Danijela ĐUNISIJEVIĆ-BOJOVIĆ, Marijana MILUTINOVIĆ	224

EFFECTS OF THE SOWING DATE ON RELATIONSHIPS OF MORPHOLOGICAL PROPERTIES OF MAIZE EARS

Marijenka TABAKOVIĆ, Rade STANISAVLJEVIĆ, Dobrivoj POŠTIĆ, Ratibor ŠTRBANOVIĆ, Violeta ORO, Milena ŠENK, Sveta RAKIĆ 225

LOW NICOSULFURON AND MESOTRIONE RATES INFLUENCE ON VARIOUS CROPS

Milan BRANKOV, C. Bruno VIEIRA, Milena SIMIĆ, Željko DOLIJANOVIĆ, Miodrag TOLIMIR, Vesna DRAGIČEVIĆ 226

THE EVALUATION OF THE STABILITY OF SOME ZP MAIZE HYBRIDS BASED ON THE GENOTYPE × ENVIRONMENT INTERACTION

Milan STEVANOVIĆ, Aleksandar KOVAČEVIĆ, Slaven PRODANOVIĆ, Milica NIKOLIĆ, Marko MLADENOVIĆ, Snežana MLADENOVIĆ DRINIĆ, Sanja PERIĆ 227

THE GRAIN YIELD STABILITY ANALYSIS OF THE ZP COMMERCIAL MAIZE HYBRIDS BASED ON MULTI-ENVIRONMENTAL TESTING

Marko MLADENOVIĆ, Zoran ČAMDŽIJA, Aleksandar KOVAČEVIĆ, Sanja PERIĆ, Milan STEVANOVIĆ, Olivera ĐORĐEVIĆ MELNIK, Nikola GRČIĆ 228

YIELD COMPONENTS OF BIOMASS AND GRAIN OF SOYBEAN IN RESPONSE TO THE USE OF BIOFERTILIZER

Milena ŠENK, Milena SIMIĆ, Milan BRANKOV, Marijenka TABAKOVIĆ, Branka KRESOVIĆ, Vesna PERIĆ, Vesna DRAGIČEVIĆ 229

INFLUENCES OF HERBICIDE TREATMENTS AND ROW SPACES ON THE MAIZE GROWTH AND YIELD PARAMETERS

Milena SIMIĆ, Milan BRANKOV, Milosav BABIĆ, Željko DOLIJANOVIĆ, Branka KRESOVIĆ, Vesna DRAGIČEVIĆ 230

GRAIN YIELD IN MAIZE HYBRIDS OF DIFFERENT FAO MATURITY GROUPS

Milomirka MADIĆ, Dragan ĐUROVIĆ, Vladeta STEVOVĆ, Dalibor TOMIĆ, Milan BIBERDŽIĆ, Aleksandar PAUNOVIĆ 231

“HOPE IN HOPS” -PROJECT OF UTILIZING THE EXISTENT AND CREATING A NOVEL GENE POOL TO REVIVING HOPS PRODUCTION IN SERBIA

Miodrag DIMITRIJEVIĆ, Sofija PETROVIĆ, Ján KIŠGECI, Tihomir ZORANOVIĆ, Ján BOŤÁNSKY, Borislav BANJAC, Jovan CRNOBARAC, Borivoj PEJIĆ, Vanja ERCEG 232

BIOFUNGICIDES IN THE PRODUCTION OF HEALTHY SEEDLINGS

Miroslava MARKOVIĆ, Renata GAGIĆ – SERDAR, Marija MILOSAVLJEVIĆ, Snežana STAJIĆ 233

IN VITRO ANTIOXIDANT ACTIVITY OF SATUREJA KITAIBELII WIERZB. EX HEUFF. SUBCRITICAL WATER EXTRACT

Nemanja ŠPIRIĆ, Vanja ŠEREGELJ, Vesna TUMBAS, Olja ŠOVLJANSKI, Ana TOMIĆ, Milica AĆIMOVIĆ 234

INFLUENCE OF GEOGRAPHICAL ORIGIN ON ANTIMICROBIAL ACTIVITY OF *ROSMARINUS OFFICINALIS* L. ESSENTIAL OILS

Nikola CVETKOVIĆ, Ana TOMIĆ, Olja ŠOVLJANSKI, Saša ĐUROVIĆ, Siniša MARKOV 235

ASSOCIATION AMONG SUNFLOWER YIELD CONTRIBUTING TRAITS IN VARIOUS ECOLOGICAL CONDITIONS

Petar ČANAK, Milan MIROSAVLJEVIĆ, Milan JOCKOVIĆ, Miroslav ZORIĆ, Bojana VUJOŠEVIĆ, Dušan STANISAVLJEVIĆ, Vladimir MIKLIČ 236

INFLUENCE OF LOCATION ON PHENOLOGICAL AND PRODUCTION PROPERTIES OF RASPBERRY (*RUBUS IDAEUS* L.)

Radmila ILIĆ, Ivan GLIŠIĆ, Tomo MILOŠEVIĆ, Gorica PAUNOVIĆ, Tomislav ĆURČIĆ 237

TOTAL FLAVONOID CONTENT IN EDIBLE PARTS OF SELECTED *ALLIUM* SPECIES

Sandra VUKOVIĆ, Đorđe MORAVČEVIĆ, Jelica GVOZDANOVIĆ-VARGA, Ilinka PEĆINAR, Ana VUJOŠEVIĆ, Sofija KILIBARDA, Danijel D. MILINČIĆ, Stefan GORDANIĆ, Dragoljub PAVLOVIĆ, Aleksandar Ž. KOSTIĆ 238

HYDROXYCINNAMICACID DERIVATIVES: POTENTIAL ANTIOXIDANTS IN RARE GROWN *ALLIUM* SPECIES FROM SERBIA

Sandra VUKOVIĆ, Đorđe MORAVČEVIĆ, Jelica GVOZDANOVIĆ-VARGA, Ilinka PEĆINAR, Ana VUJOŠEVIĆ, Sofija KILIBARDA, Danijel D. MILINČIĆ, Stefan GORDANIĆ, Dragoljub PAVLOVIĆ, Aleksandar Ž. KOSTIĆ 239

RESULTS OF TESTING OF SEEDERS WITH DIFFERENT SOWING MECHANISMS IN MAIZE SOWING

Saša BARAĆ, Dragan PETROVIĆ, Milan BIBERDŽIĆ, Rade RADOJEVIĆ, Aleksandar Đikić, Aleksandar VUKOVIĆ, Dragana LALEVIĆ..... 240

CHEMICAL AND PHYSICAL PROPERTIES OF SOIL UNDER PLANTATIONS OF OBLACINSKA CHERRY IN TOPLICA DISTRICT

Slađana GOLUBOVIĆ, Jugoslav TRAJKOVIĆ, Sanja PERIĆ, Milić VOJINOVIĆ, Dušica ĆIRKOVIĆ 241

‘LEDA’ A NEW SOUR CHERRY CULTIVAR

Slavica ČOLIĆ, Ivana BAKIĆ, Dragan RAHOVIĆ, Gordan ZEC, Zoran JANKOVIĆ, Aleksandar TABAKOVIĆ, Ivana GLIŠIĆ, Žaklina KARAKLAJIĆ-STAJIĆ..... 242

THE EFFECT OF ACTINOMYCETES APPLICATION ON GREEN MASS YIELD OF RED CLOVER

Snežana ANDJELKOVIĆ, Zoran LUGIĆ, Snežana BABIĆ, Jasmina MILENKOVIĆ, Goran JEVTIĆ, Jordan MARKOVIĆ, Filip BEKČIĆ..... 243

ANALYSIS OF THE RELATIONSHIP OF THE MOST IMPORTANT TRAITS IN MEADOW FESCUE

Snežana BABIĆ, Dejan SOKOLOVIĆ, Snežana ANĐELKOVIĆ, Mirjana PETROVIĆ, Vladimir ZORNIĆ, Mladen PRIJOVIĆ, Filip BEKČIĆ 244

EFFECTS OF IBA STIMULATORS ON PROPAGATION OF *LAVANDULA ANGUSTIFOLIA* MILL. BY SOFTWOOD CUTTINGS

Snežana MRĐAN, Dragoja RADANOVIĆ, Jovan CRNOBARAC, Tatjana MARKOVIĆ, Ana DRAGUMILO, Vladimir FILIPOVIĆ, Stefan GORDANIĆ, Sara MIKIĆ, Željana PRIJIĆ 245

THE EFFECT OF SODIC SOIL ABIOTIC STRESS CONDITIONS ON PHENOTYPE VARIATION OF SPIKE TRAITS IN HIGH YIELDING BREAD WHEAT

Sofija PETROVIĆ, Miodrag DIMITRIJEVIĆ, Borislav BANJAC..... 246

EFFECT OF DIFFERENT STRATIFICATION DURATIONS ON INCREASED GERMINATION OF *ALLIUM URSINUM* SEEDS

Stefan GORDANIĆ, Dragoja RADANOVIĆ, Tatjana MARKOVIĆ, Aleksandar Ž. KOSTIĆ, Sandra VUKOVIĆ, Sofija KILIBARDA, Đorđe MORAVČEVIĆ 247

INFLUENCE OF GROWTH BIOREGULATORS ON SEED GERMINATION OF SOME MEDICINAL AND AROMATIC PLANTS

Stefan GORDANIĆ, Đorđe MORAVČEVIĆ, Dragoja RADANOVIĆ, Tatjana MARKOVIĆ, Aleksandar Ž. KOSTIĆ, Sandra VUKOVIĆ, Snežana MRĐAN, Sofija KILIBARDA, Vladimir FILIPOVIĆ, Sara MIKIĆ, Željana PRIJIĆ 248

DEVELOPMENT AND IMPLEMENTATION OF METHODS TO DETERMINE AN AGE STRUCTURE IN HARE POPULATION IN HUNTING GROUNDS OF SERBIA

Stefan STEPIĆ, Zoran POPOVIĆ, Mladen POPOVAC, Dejan BEUKOVIĆ, Vukan LAVADINOVIĆ 249

THE INFLUENCE OF AGROECOLOGICAL CONDITIONS OF GROWING ON THE SMOKE SENSORY PROPERTIES OF BURLEY TOBACCO

Vesna RADOJIČIĆ, Lazar PEJIĆ, Željko DOLIJANOVIĆ 250

RESEARCH OF HUMUS REPRESENTATION IN AGRICULTURAL LAND

Vladimir SABADOŠ, Danijela ŽUNIĆ, Nataša PRODANOVIĆ 251

INFLUENCE OF DIFFERENT DENSITIES DURING SOWING ON BUCKWHEAT (*FAGOPIRUM ESCULENTUM* L.) YIELD AS A SUBSEQUENT IN AGRICULTURE

Vladimir SABADOŠ Danijela ŽUNIĆ 252

GENERAL COMBINING ABILITY AND HETEROSIS OF SEX EXPRESSION TRAITS IN MELON

Zdenka GIREK, Suzana PAVLOVIĆ, Jelena DAMNJANOVIĆ, Slađan ADŽIĆ, Milan UGRINOVIĆ, Dejan CVIKIĆ, Nenad PAVLOVIĆ 253

***SATUREJA MONTANA* L. CULTIVATION UNDER PERMEABLE MULCH FILM IN DRY FARMING CONDITIONS OF SOUTH BANAT (SERBIA)**

Dragoja RADANOVIĆ, Snežana MRDJAN, Ana DRAGUMILO, Tatjana MARKOVIĆ, Vladimir FILIPOVIĆ, Željana PRIJIĆ, Stefan GORDANIĆ 254

GENETIC RESOURCES OF SERBIAN NATIVE HERBACEOUS PEONIES

Zeljana PRIJIC, Tatjana MARKOVIC, Biljana PANJKOVIC, Dragoja RADANOVIC, Sara MIKIC, Snezana MRDJAN, Vladimir FILIPOVIC	255
THE IMPACT OF INTEGRATED GROWING SYSTEM AND TOP DRESSING IN PRODUCTIVITY OF WINTER WHEAT	
Željko DOLIJANOVIĆ, Snežana OLJAČA, Dušan Kovačević, Milena SIMIĆ, Srđan ŠEREMEŠIĆ, Nemanja GRŠIĆ	256
INFLUENCE OF VINEYARD GRASS COVER ON TECHNOLOGICAL CHARACTERISTICS OF WINE GRAPE CULTIVARS	
Zoran PRŽIĆ, Željko DŽELETOVIĆ, Aleksandar SIMIĆ, Nebojša MARKOVIĆ, Zorica RANKOVIĆ VASIĆ, Marija ĆOSIĆ, Mariana NICULESCU.....	257
SOIL ORGANIC MATTER AND SOIL STRUCTURE IN LONG-TERM FERTILIZED SANDY SOIL	
Vladimír ŠIMANSKÝ, Nora POLLÁKOVÁ, Jerzy JONCZAK.....	258
RESPONSE OF BARLEY (<i>HORDEUM VULGARE</i> L.) TO FOLIAR APPLICATION OF SILICON	
Anja MAVRIČ, Aleksandra GOLOB, Nina KACJAN MARŠIĆ, Mateja GERM.....	259
EVALUATION OF PRESRAUTING AND DIRECT COVERING TO ENHANCE EARLY TUBER YIELD OF POTATO CROPS (<i>SOLANUM TUBEROSUM</i> L.)	
Dragan ŽNIDARČIČ	260
ANALYSIS OF THE CLIMATOLOGICAL VARIABLES AND THE INDEX NDVI IN THE CULTIVATION OF THE OLIVE TREE IN EXTREMADURA (SPAIN)	
Fulgencio HONORIO GUIADO, Abelardo GARCÍA MARTIN, Luis L. PANIAGUA SIMÓN, Francisco J. REBOLLO CASTILLO, Francisco MORAL GARCÍA, Adélia OLIVEIRA DE SOUSA, Carina DE NÓBREGA BARCELOS, José R. MARQUES DA SILVA	261
TRENDS IN EVAPOTRANSPIRATION IN THE SOUTHWEST OF THE IBERIAN PENINSULA, IN THE CONTEXT OF GLOBAL WARMING	
Abelardo GARCÍA-MARTÍN, Luis L. PANIAGUA, Fulgencio HONORIO, Francisco J. MORAL, Francisco J. REBOLLO, Virginia ALBERDI.....	262
GENOTYPING OF SOME SELF-(IN) COMPATIBILITY SI/SC RESPONSIBLE GENES (S_x, S_F-RNASE) IN SOME ALMOND CULTIVARS	
Najwa M. ALHAJJAR, Bayan M. MUZHER	263
IMPACT OF PRUNING LEVEL ON THE PRODUCTIVITY AND QUALITY PARAMETERS OF CARIGNAN WINE GRAPE CULTIVAR UNDER AS-SWEIDA GOVERNORATE CONDITIONS	
Bayan M. MUZHER, Ola T. ALHALABI, Samer ABOU-HAMDAN.....	264
FRUITING PATTERNS OF SOME STRAWBERRY CULTIVARS IN OPEN FIELD AND GREENHOUSE CONDITIONS	

Derya MISIR, Ayşenur KANDEMİR, Dilek SOYSAL, Adis LIZALO, Leyla DEMİRSOY	265
THE EFFECT OF CLIMATE CHANGE AND THE INFORMATION SOURCES USED IN THE ENTERPRISES PRODUCING SUNFLOWERSEED	
Aysun YENER ÖGÜR, Muzaffer KAYGUSUZ, Şiyar BİLİK, Murat ALP	266
AGRO-MORPHOLOGICAL CHARACTERIZATION OF SIX-ROW BARLEY (<i>HORDEUM VULGARE</i> CONVAR. <i>HEXASTICHON</i> L.) LANDRACES	
Guray AKDOĞAN, Berk BENLIOĞLU, Namuk ERGÜN, Hüseyin DEMİRÇİ, Melih BİLİR, Sinan AYDOĞAN, İsmail SAYIM	267
ROLE OF DIFFERENT PHOSPHORUS LEVELS ON THE SEED YIELD AND SOME YIELD COMPONENTS OF CLUSTER BEAN (<i>Cyamopsis tetragonoloba</i> (L.) Taub.)	
Hakan GEREN, Tuğçe OZDOĞAN CAVDAR, Zeynep SEN, Ahmet Sefa KUKTAS	268
GRAIN YIELD AND SOME AGRONOMICAL CHARACTERISTICS OF TEFF [<i>Eragrostis tef</i> (Zucc.) Trotter] AS AFFECTED BY SOWING DATES	
Hakan GEREN, Tuğçe OZDOĞAN CAVDAR, Aleksandar SIMIĆ, Zeljko S. DZELETOVIĆ	269
GROWTH AND DEVELOPMENT OF ‘ALBION’, ‘PORTOLA’ AND ‘SWEET ANN’ DAY-NEUTRAL STRAWBERRY VARIETIES IN SUMMER AND FALL CROP PRODUCTION	
Nazlı ATEŞ, Dilek SOYSAL, Derviş Emre DOĞAN, Leyla DEMİRSOY	270
Keywords: Day-neutral strawberry, Summer crop production, Growing, Development, Seasonal variation	270
EVALUATION OF TURKEY STONE FRUIT SAPLING PRODUCTION	
Mehmet SÜTYEMEZ	271
THE DEVELOPMENT OF <i>CONVOLVULUS ARVENSIS</i> COLLECTED FROM DIFFERENT PROVINCES UNDER DIFFERENT TEMPERATURE AND CO₂ CONDITIONS	
Yücel KARAMAN, Nihat TURSUN, Ahmet ULUDAG	272
THE EFFECTS OF THE ESSENTIAL OIL OF PENNYROYAL (<i>MENTHA PULEGIUM</i> L.) ON THE GERMINATION OF SOME WEED AND CROPSEEDS	
Yücel KARAMAN, Nihat TURSUN	273
DETERMINATION OF THE EFFECT OF CONVENTIONAL AND REDUCED TILLAGE SYSTEMS ON WEED DENSITY IN WHEAT PRODUCTION	
Osman Mert YAZ, Sakine ÖZPINAR	274
‘KSU-46’ WALNUT CULTIVAR	
Mehmet SÜTYEMEZ, Şakir Burak BÜKÜCÜ, Akide ÖZCAN	275
DETERMINATION OF THE PRODUCTIVITY AND DEVELOPMENT STATUS OF THE SECONDARY BUDS IN THE KARAERİK GRAPE VARIETY	
Muhammed KUPE, Sezai ERCİSLİ	276

FATTY ACID DIVERSITY IN CULTIVATED AND WILD APRICOTS FROM EASTERN ANATOLIA IN TURKEY	
Mehmet Ramazan BOZHUYUK, Sezai ERCISLI	277
EVALUATION OF THE EFFECT OF TESBI (<i>STYRAX OFFICINALIS</i> L.) SEED EXTRACTS ON SEEDLING DEVELOPMENT OF SOME PLANTS	
Tansu USKUTOĞLU, Belgin COŞGE ŞENKAL, Hülya DOĞAN	278
THE INFLUENCE OF NITROGEN ON THE GRAIN YIELD AND SOME AGRONOMIC CHARACTERISTICS OF SWEET SORGHUM (<i>Sorghum bicolor</i> var. <i>saccharatum</i>)	
Tugçe OZDOGAN CAVDAR, Esra CAM, Hakan GEREN	279
POTENTIAL GROWTH AND HERBAGE PRODUCTIVITY OF COMMON BURNET (<i>Poterium sanguisorba</i>) AS AFFECTED BY NITROGEN FERTILIZATION	
Tugce OZDOGAN CAVDAR, Deniz Alp AKCAY, Hakan GEREN	280
THE COMPARISON ANALYSIS OF SOFTWARE FOR MANTEL TEST BETWEEN DNA MARKERS AND MORPHOLOGICAL TRAITS OF PLANT VARIETIES	
Larysa PRYSIAZHNIUK, Yevhenii STARYCHENKO, Svitlana HRYNIV, Yuliia SHYTIKOVA, Nadiia LESHCHUK, Serhii MELNYK, Oksana KLIACHENKO	281
FEATURES OF CHEMICAL COMPOSITION AND TECHNOLOGICAL CHARACTERISTICS OF ROOT OF SUGAR BEET GENOTYPES	
Oksana KLIACHENKO, Larysa PRYSIAZHNIUK	282
BIOCHEMICAL PROFILING OF SUNFLOWER HYBRIDS (<i>HELIANTHUS ANNUUS</i> L.) IN THE ASPECT OF HERBICIDES RESISTANCE	
Oksana KLYACHENKO, Artur LIKHANOV, Anatolii YUNYK, Svitlana KALENSKA	283
2. PLANT PROTECTION AND FOOD SAFETY	284
CHEMICAL ANALYSIS AND SENSORY EVALUATION OF “DOMIATI CHEESE” USING STRAINS ISOLATED FROM ALGERIAN GOAT MILK	
Abderrahim CHERIGUENE, F. CHOUGRANI	285
IN VITRO STUDY OF THE LARVICIDAL ACTIVITY OF HYDRO-ALCOHOLIC EXTRACT <i>URTICA MEMBRANACEA</i> POIR. ON <i>TUTA ABSOLUTA</i>	
Fariâl KRACHE, Malika BOUALEM, Fouzia BENOURAD, Djilali BENABDELMOUMENE, Mohamed BOUCHARBEB, Nacer DEFOUS	286
CULTURE OF THE SPECIES <i>PORTULACA OLERACEA</i> L. IN THE ALGERIAN OASES OF THE NORTHEASTERN SAHARA	
Fatiha HADJAJI-BENSEGHIER, HADJAJI SAWSEN	287
CONTRIBUTION TO THE DEMONSTRATION OF THE EFFECT OF HIGH TEMPERATURES ON ANTIBIOTIC RESIDUES IN MILK	
Fatima IDRIS KHODJA, Kaddour ZIANI, Nisserine HAMINI KADAR	288

BIOECOLOGICAL STUDY OF THE PSYLL OF THE OLIVE TREE EUPHYLLURA OLIVINA COSTA 1839 (HEMIPTERA: APHALARIDAE) IN NORTH WEST ALGERIAN (MOSTAGANEM, RELIZANE AND MASCARA)	
Ouezzani KARIMA, Boualem M., Ghoulamallah A.	289
GRAIN WEIGHT LOSS AND DEVELOPMENT OF SITOPHILUS ORYZAE (L.) ON NEEM INSECTICIDE TREATED WHEATS AT DIFFERENT STORAGE PERIODS	
Dipali Rani DAS, Saiful Islam FARUKI.....	290
VIROLOGICAL RESEARCH ON ŽILAVKA AND BLATINA LOCAL GRAPE VARIETIES	
Ana CRNOGORAC, Ana MANDIĆ, Emanuela NORIS, Salvatore DAVINO Slavica MATIĆ	291
MICROBIOLOGICAL STATUS OF WATER IN FOOD INDUSTRY OF ANIMAL ORIGIN IN REPUBLIC OF SRPSKA (BOSNIA AND HERZEGOVINA) IN THE PERIOD 2018-2020 IN RELATION TO THE EXAMINED PARAMETERS	
Bojan GOLIC, Vesna KALABA, Tanja ILIĆ.....	292
REAL TIME PCR AND LAMP METHODS FOR DETECTION OF FLAVESCENCE DORÉE	
Mišaela VAKIĆ, Toufic ELBEAINO, Mihajlo VORUNA, Duška DELIĆ	293
SURVEY ON THE PRESENCE OF ERWINIA AMYLOVORA, THE CAUSAL AGENT OF FIRE BLIGHT IN REPUBLIC OF SRPSKA DURING 2016-2020	
Vojislav TRKULJA, Gordana BABIĆ, Bojana ĆURKOVIĆ, Bojana VUKOVIĆ, Jelena MIHIĆ SALAPURA, Jovana PRIJIĆ, Bogdan NEDIC	294
ASSESSMENT OF IN VITRO PROAPOPTOTIC AND GENOTOXIC POTENTIAL OF AGRO BIOSTIMULANT KAISHI ON HUMAN CELLS	
Georgi ANTOV, Zlatina GOSPODINOVA, Mariyana GEORGIEVA, Violeta VELIKOVA.....	295
RESISTANCE OF MAIZE HYBRIDS TO EUROPEAN CORN BORER (OSTRINIA NUBILALIS HUEBNER) UNDER THE CONDITIONS OF CENTRAL NORTHERN BULGARIA	
Lilyana KOLEVA, Georgi DIMITROV, Janet KOSTOVA.....	296
IDENTIFICATION OF MITES ASSOCIATED WITH CITRUS CROP (Citrus sp.) IN THE DEPARTMENT OF CALDAS, COLOMBIA	
Daniel CASTAÑO-SUAREZ, Juan Manuel OSORNO-MARÍN, Edwin Javier QUINTERO-GUTIÉRREZ, Carolina ZAMORANO-MONTAÑEZ	297
EFFECT OF BENEFICIAL BACTERIUM BACILLUS SUBTILIS ON THE GREATER WAX MOTH (GALLERIA MELLONELLA) MORTALITY	
Ivana MAJIĆ, Tena JELIĆ, Gabriella KANIŽAI ŠARIĆ, Marin KOVAČIĆ, Zlatko PUŠKADIJA, Emilija RASPUDIĆ, Ankica SARAJLIĆ	298
INFLUENCE OF ENDOPHYTIC FUNGI ON WHEAT DISEASE INCIDENCE	
Jelena ILIC, N. PILINGER, J. COSIC, K. VRANDECIC	299

CONSUMERS' BEHAVIOR TOWARDS FOOD WASTE: A CASE STUDY OF FAYOUM, EGYPT	
Mahmoud ABDELSALAM AHMED MOHAMED	300
EFFECT OF SOME POTASSIUM SALTS ON ONION PURPLE BLOTCH INCIDENCE AND SOME PHYSIOLOGICAL AND YIELD PARAMETERS IN ONION SEED PLANTS	
Hanan S. SOFY, Hoda M. H. AHMED, Maisa L. ABD-EL-MONEIM, Mohamed A. A. HASSAN	301
EFFECT OF POTASSIUM SALTS ON ONION PURPLE BLOTCH INCIDENCE AND SOME PHYSIOLOGICAL AND YIELD PARAMETERS IN ONION SEED PLANTS	
Hanan S. SOFY, Hoda M.H. AHMED, Maisa L. ABD-EL-MONEIM, Mohamed HASSAN.....	302
ORGANOLEPTIC CHARACTERISTICS EVALUATION OF DIAB MANGO FRUITS AS AFFECTED BY HOT WATER TREATMENTS	
S.M.A. SARRWY, Dorria M.M. AHMED, Aml R.M. YOUSEF	303
SRAP MARKERS ASSOCIATED WITH RESISTANCE TO LOOSE SMUT IN SOME EGYPTA IN BARLEY GENOTYPES	
Ismeal A. KHATAB, Samah, A. MARIEY, Sherin Ph. MIKHAIL	304
EFFICACY OF TWO NATURAL EXTRACTS AND ANTIOXIDANTS IN REDUCING POWDERY MILDEW DISEASE OF BARLEY	
Sherin Ph. MIKHAEL, M. MANSOUR, Hoda E.A. IBRAHIM	305
THE PHYTOSTIM PROJECT (2021-2025): TOWARD AN INTEGRATIVE ANALYSIS OF PHYTOSTIMULANT MODE OF ACTION AND ACCEPTANCE	
Cécile CABASSON, Nicolas GUIBERT, Sabri NAJAI, Joana JORLY, Pierre PETRIACQ, Sylvain PRIGEANT, Frédéric DELMAS, Michel HERNOULD, Jean-Marc DEOGRATIAS, Maïder SAINT JEAN, Yves GIBON.....	306
CRYSTALLIZATION BEHAVIOR OF COCOA BUTTER: THE INFLUENCE OF REGIONAL ORIGIN IN COLOMBIA: TUMACO - HUILA - SANTANDER	
M. BIGOT, A. CAMPAIGNOLLE, V. CHARPENTIER, J. FREULARD, A. MESSENGER, Daniel J. E. KALNIN.....	307
VALORISATION OF CAROB FLOUR (CERATONIA SILIQUA L.) IN THE BISCUITRY AND PASTRY SECTORS	
S. ANGER, A. CECCALDI, M. GIDOIN, L. KIEFFER, D. KALNIN, Ludovic ANDRES	308
PHYSICO-CHEMICAL CHARACTERIZATION AND THE FUNCTIONING OF PLANTAIN BANANA FLOUR BY REPORTING THEIR ORIGIN	
A. BEJA, M.-V. DOUZEAU DCALET, E. NDJIE, C. TAKOUGANG, H. BOUVET, J.-R. AUGUSTIN, D. KALNIN, Ludovic ANDRES.....	309
INTRODUCTION AND VALORISATION OF HONEY IN A SEASONAL BEER	
BOULAYM, M. MALIGE, J. OGE, ROUTHIAUL, Ludovic ANDRES	310

BIOSTIMULANTS IN HORTICULTURE: HOW DIFFICULT IS IT TO VALUE TECHNO-ECONOMIC COMPROMISES?	
Cécile CABASSON, Nicolas GUIBERT, Maïder SAINT JEAN.....	311
POPULATION DYNAMICS OF CONFUSED FLOUR BEETLE, <i>TRIBOLIUM CONFUSUM</i> JACQUELIN DU VAL IN GRAIN MILLS	
Ebraheem AL-JOURI, Fatima SHIHADI, Sliman SLIMAN.....	312
INFLUENCE OF SOWING DATE OF THE MAIZE HYBRID "BASSEL 1" ON THE INFESTATION LEVEL OF STEM BORERS IN DEIR EZ-ZOR REGION, SYRIA	
Ebraheem AL-JOURI.....	313
WEED CONTROL IN PARSLEY: COMPARATIVE PHOTOMETRIC ANALYSIS	
Fiona SAILER, Julia HELFERT, Iryna SMETANSKA.....	314
EVALUATION OF POLYHENOL EXTRACTION FROM APPLE POMACE	
Faraja Deo GONELIMALI, Beatrix SZABÓ-NÓTIN, Lilla SZALÓKI-DORKÓ, Ákos RIBÁRSZKI, Mónika MÁTÉ.....	315
EFFECT OF GELATIN BASED EDIBLE COATINGS ON MINIMALLY PROCESSED APPLE (<i>MALUS DOMESTICA</i> BORKH) CUBES	
Pradeep KUMAR, Dóra SZÉKELY, Mónika MÁTÉ.....	316
EFFECT OF PRETREATMENT OF SEED WITH COLD PLASMA ON SOME PHYSIOLOGICAL AND QUALITY TRAITS OF SUNFLOWER (<i>HELIANTHUS ANNUUS</i> L.) PLANT IN COMPLETION WITH WEEDS	
Mojgan KHAKIAN, Hassan MAKARIAN, Mehdi BARADARAN FIROUZ ABADI, Hossein MIRZAEI MOGHADAM, Mehdi MOMENI, Maziar FARZINBEH.....	317
THE EFFECT OF EDIBLE COATING BASED ON THE RICE BRAN OIL AND ACETYLATED POTATO STARCH ON QUALITY CHARACTERISTICS OF GRAPE	
Masoud TAGHIZADEH, Azin OMID JEIVAN.....	318
IRANIAN KISHK AS A SOURCE OF LACTIC ACID BACTERIA PRODUCING EXOPOLYSACCHARIDE	
Mohammad Reza EDALATIAN DOVOM, Paria RAHNAMA VOSOUGH, Mohammad B. HABIBI NAJAFI, Ali JAVADMANESH, Baltasar MAYO.....	319
ETIOLOGY AND INCIDENCE OF PISTACHIO ENDOCARP LESION DISORDER IN PISTACHIO ORCHARDS OF KERMAN PROVINCE, IRAN	
Somayeh SADR, Vahid MOZAFARI.....	320
INVASIVENESS, DAMAGE, AND MANAGEMENT OF THE SUPERVECTOR WHITEFLY <i>BEMISIA TABACI</i> IN AGRICULTURAL CROPS	
Murad GHANIM.....	321
A PLANT DISEASE COMPLEX BETWEEN A PLANT PARASITIC NEMATODE AND A FUNGUS - REEVALUATING <i>PRATYLENCHUS CAPSICI</i> DISEASE ETIOLOGY	

Sigal BRAUN MIARA, Abraham GAMLIEL, Patricia BUCKI, Svetlana DUVRININ, Ohad AVRAHAM, Marina BENICHIS, Xue QING.....	322
STUDIES OF XYLELLA FASTIDOSA IN THE XYLEM SAP OF OLIVE AND OLEANDER	
Antony SURANO, Raied ABOU KUBAA, Pasquale SALDARELLI, Maria SAPONARI	323
PROFILE OF ANTIBACTERIAL ACTIVITY OF MORINGA OLEIFERA LEAF EXTRACTS AGAINST THE PHYTOPATHOGEN XANTHOMONAS CAMPESTRIS PV. CAMPESTRIS	
Anna CAPRONI, Riccardo FONTANA, Giovanna MACCHI, Irene GUGEL, Giorgia ROSSETTI, Mariaconcetta SICURELLA, Mattia BURATTO, Mariangela PAPPADÀ, Francesca SALVATORI, Raissa BUZZI, Anna BALDISSEROTTO, Stefano MANFREDINI, Peggy MARCONI.....	324
ANTIBACTERIAL ACTIVITY OF MORINGA OLEIFERA LEAF EXTRACTS AGAINST THE PLANT PATHOGEN ERWINIA AMYLOVORA	
Riccardo FONTANA, Giovanna MACCHI, Anna CAPRONI, Irene GUGEL, Mariaconcetta SICURELLA, Mariangela PAPPADÀ, Francesca SALVATORI, Mattia BURATTO, Anna BALDISSEROTTO, Stefano MANFREDINI, Peggy MARCONI	325
DEPENDENCE OF THE CHEMICAL COMPOSITION OF COWSLIP (PRIMULA VERIS L.) INFLORESCENCES ON THE SOIL	
Aurelija PAULAUSKIENĖ, Živilė TARASEVIČIENĖ	326
EXOGENOUSLY APPLIED PUTRESCINE EFFECTS ON ENDOGENOUS IAA IN KIDNEY BEAN AND PEA UNDER LOW-TEMPERATURE STRESS	
Jurga JANKAUSKIENĖ, Sigita JURKONIENĖ, Virgilija GAVELIENĖ, Rima MOCKEVIČIŪTĖ, Elžbieta JANKOVSKA-BORTKEVIČ, Dessislava TODOROVA, Iskren SERGIEV	327
EFFECT OF DIFFERENT RAW MATERIALS POWDER ON TEXTURE AND COLOUR PROPERTIES OF YOGURT BITES	
Jurgita KULAITIENĖ, Nijolė VAITKEVIČIENĖ, Dovilė LEVICKIENĖ.....	328
CHANGES IN FRUIT SIZE AND BIOCHEMICAL COMPOSITION OF VIBURNUM OPULUS FRUITS DURING RIPENING	
Remigijus DAUBARAS, Laima ČESONIENĖ, Pranas VIŠKELIS.....	329
STUDIES ON THE DIVERSITY OF PHENOLIC COMPOUNDS IN ACTINIDIA KOLOMIKTA BERRIES	
Laima ČESONIENĖ, Mindaugas LIAUDANSKAS, Vaidotas ŽVIKAS, Remigijus DAUBARAS	330
The EFFECT OF DRYING TECHNOLOGIES ON THE Quality of Dried Beetroot powder	
Živilė TARASEVIČIENĖ, Aura DEGIMIENĖ, Aurelija PAULAUSKIENĖ, Judita ČERNIAUSKIENĖ.....	331
RADIOACTIVITY LEVELS IN SOME MUSHROOM SPECIES COLLECTED FROM MACEDONIA AND CONSEQUENT DOSES	

Angeleska ALEKSANDRA, Radmila CRCEVA NIKOLOVSKA, Elizabeta DIMITRIESKA STOJKOVIK, Katerina BLAGOEVSKA, Biljana DIMZOSKA STOJANOVSKA, Risto UZUNOV, Vasilka POPOSKA TRENEVSKA.....	332
RADIATION LEVELS IN SAMPLES OF DICALCIUM PHOSPHATE (DCP) WITH A GAMMA SPECTROMETRY METHOD	
Angeleska ALEKSANDRA, Radmila CRCEVA NIKOLOVSKA, Katerina BLAGOEVSKA, Elizabeta DIMITRIESKA STOJKOVIK, Biljana DIMZOSKA STOJANOVSKA, Risto UZUNOV	333
VARIABLE COMPONENTS DETERMINING THE PRIMARY RESISTANCE TO EXTREME TEMPERATURES OF THE WHEAT SEEDS REPRODUCED IN DIFFERENT CLIMATIC ZONE	
Alexandru DASCALIUC, Tudor RALEA, Nina ZDIORUC.....	334
<i>BACILLUS AMYLOLIQUEFACIENS</i> I3: AN EFFECTIVE BIOCONTROL AGENT IN THE INDUCTION OF SYSTEMIC RESISTANCE IN <i>ARABIDOPSIS THALIANA</i>	
Ilham BARAKAT, Nouredine CHTAINA, Philippe GRAPPIN, Mohammed EL GUILLI, Brahim EZZAHIRI, Sophie ALIGON, Martine NEVEU, Muriel MARCHI.....	335
INTERFERENCE COMPETITION BETWEEN LADYBIRD BEETLE ADULTS (COLEOPTERA: COCCINELLIDAE) ON PRICKLY PEAR CACTI PEST <i>DACTYLOPIUS OPUNTIAE</i> (HEMIPTERA: DACTYLOPIIDAE)	
Mohamed EL AALAOUI, Mohamed SBAGHI	336
EVALUATION OF QUALITY AND SHELF-LIFE OF FRESH AND FLESHY CUCUMBER STORED IN CHARCOAL COOLER BIN IN THE TROPICS	
Emmanuel EZECHINYELU, Chukwuemeka OHAGWU.....	337
CHITOSAN MEDIATED IMPROVEMENTS IN OSMOSIS AND METABOLITES OF HEAT STRESSED COTTON	
Abdul SHAKOOR, Muhammad FARRUKH SALEEM, Muhammad SHAHID, Muhammad SARWAR, Kent OLIVER BURKEY, Muhammad ASHFAQ WAHID, Ali RAZA	338
BIOLOGICAL CONTROL OF FUSARIUM WILT OF TOMATO BY APPLICATION OF <i>PENICILLIUM</i> SPP. AND <i>CHENOPODIUM MURALE</i>	
Arshad JAVAID, Syeda FAKEHHA NAQVI, Amna SHOAIB, Iqra HAIDER KHAN.....	339
FUNGI TOXIC PROPERTIES OF FOUR QUINOA VARIETIES LEAF EXTRACT AGAINST <i>MACROPHOMINA PHASEOLINA</i>	
Iqra HAIDER KHAN, Arshad JAVAID.....	340
<i>IN VITRO</i> PROFILING OF ASSOCIATED MYCOFLORA WITH ANTHRACNOSE OF MANGO INCITED BY <i>COLLETOTRICHUM</i> SPP, ITS MANAGEMENT AND DEVELOPMENT OF MODEL	
Muhammad NASIR SUBHANI, Talha MANSOOR, Ahmed ALI SHAHID, Muhammad ALI, Muhammad TARIQ MALIK, Syed ATIF HASSAN NAQVI.....	341

MODELLING OF UNSTEADY SPATIALLY DISTRIBUTED FOOD DRYING PARAMETERS ASSESSED NON-DESTRUCTIVELY (FOOD IMAGING) IN A SMALL INDUSTRIAL FOOD DRYER	
Waseem AMJAD, Anjum MUNIR.....	342
EXTARCTS FROM LAMIUM ALBUM AS A NATURAL SOURCE OF BIOACTIVE COMPOUNDS – ALTERNATIVE TO CHEMICAL CROPS PROTECTION	
Pascaline Aimee UWINEZA, Marcin BRYŁA, Agnieszka WAŚKIEWICZ	343
YIELD AND QUALITY OF TVAROG MADE FROM THE MILK OF SIMMENTAL COWS DEPENDING ON THE MILK PRODUCTION SEASON	
Jolanta KRÓL, Aneta BRODZIAK, Magdalena STOBIECKA, Joanna WAJS	344
THE INFLUENCE OF POLYOLS USED AS OSMOTIC AGENTS IN OSMOTIC DEHYDRATION PROCESS	
Magdalena CHĄDZYŃSKA, Malgorzata NOWACKA	345
FOOD SAFETY AND NUTRITIONAL PROPERTIES OF SOME EDIBLE MUSHROOMS	
Lavinia BURULEANU, Andreea Antonia GEORGESCU, Cristiana RADULESCU, Ioana Daniela DULAMA, Claudia STIHI.....	346
ENTOMOPATHOGENIC EFFECT OF SOME <i>BEAVERIA</i> ISOLATES ON THE TOMATO LEAF MINER <i>TUTA ABSOLUTA</i> (LEPIDOPTERA: GELECHIIDAE) LARVAE UNDER LABORATORY CONDITIONS	
Maria IAMANDEI, Ana-Cristina FATU, Madalina RADULEA, Ioan ROSCA.....	347
THE INFLUENCE OF THE ESSENTIAL AMINO ACIDS IN CEREALS ON THE NUTRITIONAL QUALITY OF FOOD	
Steluta RADU	348
DIFFERENTIATED HERBICIDES APPLICATION ON WINTER WHEAT CROPS USING OFFLINE INSTRUCTIONS MAP	
Dmitrii S. FOMIN, Denis S. FOMIN	349
THE USE OF POTASSIUM SALTS UNIQUE PROPERTIES FOR SUPPRESSION OF POTATO PATHOGENS DURING STORAGE PERIOD	
Alexey G. ISAEVICH, Alexander Y. MAKSIMOV, Konstantin N. KORLYAKOV, Dmitriy A. POSPELOV, Lubov' G. TSEMA, Anna L. LATYPOVA, Nikita V. ZUBOV	350
THE NEW RACES OF <i>PUCCINIA HELIANTHI</i> SCHWEIN ON SUNFLOWER IN THE RUSSIAN FEDERATION	
Nina ARASLANOVA, Tatiana ANTONOVA, Ekaterina LEPESHKO, Tatiana USATENKO, Svetlana SAUKOVA, Maria IWEBOR, Yulya PITINOVA.....	351
INVASIVE INSECT SPECIES IMPORTANCE AND POSSIBLE PATHWAYS OF THEIR SPREADING IN SERBIA	

Aleksandra KONJEVIC, Željko MILOVAC, Svetlana KONTSEDALOV, Surapathrudu KANAKALA, Murad GHANIM, Tara GARIEPY, Dmitry MUSOLIN	352
CONTROL OF ELATERIDAE AND <i>GRYLLOTALPA GRYLLOTALPA</i> IN THE TOMATO CROPS	
Slavica VUKOVIĆ, Sanja LAZIĆ, Dragana ŠUNJKA, Antonije ŽUNIĆ, Dragana BOŠKOVIĆ, Aleksandra ALAVANJA	353
OCCURRENCE OF OCHRATOXIN A IN RED WINE IN SERBIA IN 2020-2021	
Marko M. JAUKOVIĆ, Anja D. VUKSAN	354
DISSIPATION DYNAMICS OF ANTHRANILIC DIAMIDE INSECTICIDES IN SOME FRUITS	
Sanja LAZIĆ, Dragana ŠUNJKA, Slavica VUKOVIĆ, Antonije ŽUNIĆ, Dragana BOŠKOVIĆ, Aleksandra ALAVANJA	355
MICROBIOLOGICAL QUALITY OF SURFACE WATER AND SAFE VEGETABLE PRODUCTION	
Igor KLJUJEV, Vera KARLIČIĆ, Jelena JOVIČIĆ-PETROVIĆ, Ana VELIČKOVIĆ, Blažo LALEVIĆ, Vera RAIČEVIĆ	356
THE OVERVIEW ON THE FUMONISINS PRESENCE IN DURUM WHEAT GRAIN IN SERBIA DURING THE PERIOD 2015-2019	
Iva SAVIĆ, Milica NIKOLIĆ, Vesna KANDIĆ, Milan STEVANOVIĆ, Slavica STANKOVIĆ...	357
OVERVIEW OF MOLECULAR METHODS FOR DETECTION OF „<i>CANDIDATUS LIBERIBACTER SOLANACEARUM</i>”	
Jelena MENKOVIĆ, Anđelka PROKIĆ, Milan IVANOVIĆ, Aleksa OBRADOVIĆ	358
EFFECT OF MILIGARD IN CONTROL OF <i>Cercospora beticola</i>	
Jelena PERENČEVIĆ, Vladimir SABADOŠ, Mirjana Zorić, Gordana MRDAK, Tatjana VESELINOVIĆ	359
THE PROGNOSIS OF <i>CYDIA POMONELLA</i> L. THE MOST SIGNIFICANT PESTS OF APPLES	
Jelica ŽIVIĆ, Ivica STANČIĆ , Milić VOJINOVIĆ, Jugoslav TRAJKOVIĆ, Tijana ŽIVIĆ	360
THE RESISTANCE OF AUTOCHTHONOUS VARIETIES OF APPLES AND PEARS ON <i>ERWINIA AMYLOVORA</i>	
Milić VOJINOVIĆ, Jelica ŽIVIĆ, Sanja PERIĆ, Slađana GOLUBOVIĆ, Ivica STANČIĆ, Dragana STANISAVLJEVIĆ.....	361
ANTIFUNGAL ACTIVITY OF ESSENTIAL OILS ON <i>ASPERGILLUS FLAVUS</i> ORIGINATING FROM MAIZE KERNELS	
Milica NIKOLIĆ, Iva SAVIĆ, Ksenija RADOTIĆ, Slobodan KRNJAJIĆ, Dragana BARTOLIĆ, Milan STEVANOVIĆ, Slavica STANKOVIĆ	362
EFFECT OF 1-METHYLCYCLOPROPENE ON STORAGE OF PEAR 'WILLIAMS'	

Mira MILINKOVIĆ, Svetlana M. PAUNOVIĆ, Jelena TOMIĆ, Dragana VRANIĆ	363
INFLUENCE OF SULFUR DIOXIDE AND ASCORBIC ACID ON PHENOLIC ACIDS IN CABERNET SAUVIGNON WINE	
Nikolina LIŠOV, Ivana PLAVŠIĆ, Aleksandar PETROVIĆ, Ljiljana GOJKOVIĆ BUKARICA..	364
INFLUENCE OF REFINING PROCESS ON MYCOTOXIN CONTENT IN VEGETABLE OILS AND FATS	
Ranko ROMANIĆ, Sunčica KOCIĆ TANACKOV, Tanja LUŽAIĆ, Jelena KUCURSKI	365
COLOR CHARACTERISTIC OF NON-REFINED OILS OBTAINED BY COLD PRESSING OF THE SEEDS OILS OBTAINED FROM CONFECTIONARY SUNFLOWER HYBRIDS	
Ranko ROMANIĆ, Tanja LUŽAIĆ, Nada GRAHOVAC, Nada HLADNI, Snežana KRAVIĆ, Zorica STOJANOVIĆ	366
EFFICACY OF FUNGICIDES IN CONTROL OF CHERRY PATHOGEN <i>MONILINIA LAXA</i> (ADER. and RUHL.)	
Sanja PERIĆ, Jugoslav TRAJKOVIC, Sladjana GOLUBOVIC, Milic VOJINOVIC, Jelica ZIVIC	367
MORPHOLOGICAL CHARACTERISTICS OF <i>EUTYPA LATA</i> ISOLATES FROM GRAPEVINE IN SERBIA	
Sanja ŽIVKOVIĆ ¹ , Tanja VASIĆ ¹ , Darko JEVREMOVIĆ, Vojislav TRKULJA.....	368
IDENTIFICATION OF MYCOPOPULATION ON AMERICAN Highbush BLUEBERRY IN SERBIA	
Sanja ŽIVKOVIĆ, Tanja VASIĆ, Darko JEVREMOVIĆ, Aleksandar LEPOSAVIĆ	369
OCCURRENCE OF POWDERY MILDEW AND SEPTORIA LEAF BLOTCH IN WHEAT AFFECTED BY NITROGEN DOSE AND FOLIAR FERTILIZATION	
Slaviša GUDŽIĆ, Nebojša DELETIĆ, Nebojša GUDŽIĆ, Mirosljub AKSIĆ, Katerina NIKOLIĆ, Milosav GRČAK, Dragan GRČAK	370
SWEET CORN AS FUNCTIONAL FOOD	
Snežana MLADENOVIĆ DRINIĆ, Jelena VUKADINOVIĆ, Tomislav TOSTI, Jelena SRDIĆ, Ana NIKOLIĆ, Violeta ANĐELKOVIĆ, Dušanka MILOJKOVIĆ-OPSENICA	371
EFFECT OF SOIL MANAGEMENT SYSTEMS ON THE GENERATIVE POTENTIAL AND FRUIT QUALITY OF BLACK CHOKEBERRY	
Svetlana M. PAUNOVIĆ, Mira MILINKOVIĆ, Žaklina KARAKLAJIĆ-STAJIĆ, Jelena TOMIĆ, Boris RILAK.....	372
MORPHOLOGICAL CHARACTERISTICS OF <i>EUTYPALATA</i> ISOLATES FROM GRAPEVINE IN SERBIA	
Sanja ŽIVKOVIĆ, Tanja VASIĆ, Darko JEVREMOVIĆ, Vojislav TRKULJA	373
IDENTIFICATION OF MYCOPOPULATION ON AMERICAN Highbush BLUEBERRY IN SERBIA	
Sanja ŽIVKOVIĆ, Tanja VASIĆ, Darko JEVREMOVIĆ, Aleksandar LEPOSAVIĆ	374

COLOUR STABILITY OF CYANIDIN IN SLIGHTLY ACIDIC SOLUTION Violeta RAKIĆ, Vojkan MILJKOVIĆ, Milena MILJKOVIĆ, Nataša POKLAR ULRIH.....	375
INFLUENCE OF DIFFERENT DENSITIES DURING SOWING ON BUCKWHEAT (<i>FAGOPIRUM ESCULENTUM L.</i>) YIELD AS A SUBSEQUENT IN AGRICULTURE Vladimir SABADOŠ, Danijela ŽUNIĆ, Zoran BOCA	376
POD DAMAGE MONITORING IN OILSEED RAPE IN VOJVODINA Željko MILOVAC, Filip FRANETA, Ana MARJANOVIĆ JEROMELA, Petar MITROVIĆ	377
EFFECT OF A BIOSURFACTANT EXTRACTED FROM CORN STEEP LIQUOR ON THE UPTAKE OF COPPER OXYCHLORIDE BY <i>BOTRYTIS CINEREA</i> CELLS Alejandro LÓPEZ-PRIETO, Benita PÉREZ CID, Ana Belén MOLDES, José Manuel CRUZ.....	378
EFFECTS OF SOME INSECTICIDES ON THREE INSECT PREDATORS IN THE SUDAN Hayder ABDELGADER.....	379
EVALUATION OF PSEUDOMONAS AND RHIZOBIACEAE SPP. INOCULATION ON THE GROWTH AND NODULATION OF THE HYACINTH BEAN (<i>LABLAB PURPUREUS</i>) Camille BROQUET, Lucas ARMINJON, Romain CHABLAIS, Bastien COCHARD, Julien CROVADORE, Pierre-Yves BOVIGNY, François LEFORT	380
MICROBIOLOGICAL CONTROL OF <i>VARROA DESTRUCTOR</i>: EFFICACY ASSAYS OF ENTOMOPATHOGENIC FUNGI Céline CORBEX, Corentin DESCOMBES, Cyril SCHULZ, Bastien COCHARD, Martine HAENZI, Romain CHABLAIS, Julien CROVADORE, Pierre-Yves BOVIGNY, Jochen PFLUGFELDER, François LEFORT	381
MICROBIOLOGICAL CONTROL OF <i>VARROA DESTRUCTOR</i>: SELECTION AND EVALUATION OF POTENTIALLY ENTOMOPATHOGENIC MICROORGANISMS Corentin DESCOMBES, Cyril SCHULZ, Bastien COCHARD, Martine HAENZI, Romain CHABLAIS, Julien CROVADORE, Pierre-Yves BOVIGNY, Jochen PFLUGFELDER, François LEFORT	382
LINKING RESPONSE TO SHADE WITH GROWTH AND YIELD IN SEVERAL COFFEE AGROFORESTRY SYSTEMS IN ECUADORIAN AMAZONIA Kevin PIATO, Cristian SUBÍA, Lindsey NORRGROVE, François LEFORT.....	383
EVALUATION OF BACTERIAL BIOSTIMULANTS ON THE GROWTH AND FLOWER PRODUCTION OF <i>CANNABIS SATIVA L.</i> Leonardo PIVA, Bastien COCHARD, Romain CHABLAIS, Julien CROVADORE, Pierre-Yves BOVIGNY, François LEFORT	384
AGROECOLOGICAL PROPOSALS FOR ORGANIC VEGETABLE PRODUCTIONS AT A SMALL FARM IN GENEVA Zsolt MAURER, Julian TUGWELL, Pierre-Yves BOVIGNY, François LEFORT	385

FIRST RECORD OF CIRCULAR LEAF-MINER LEUCOPTERA SCITELLA ZELL. ON SEVERAL HOSTS IN SYRIA	
Nesrin DIAB, Ebraheem AL-JOURI, Adel ALMANOUFI	386
FIRST RECORD OF THE GENUS <i>GLYPTAPANTELES</i> ASHMEAD, 1904 (BRACONIDAE:MICROGASTRINAE) ON LARVAE OF TOMATO LEAF MINER <i>TUTA ABSOLUTE</i> (MEYRICK, 1917) IN SYRIA	
Rawa MUHSEN YOUSSEF, Nabil HASAN ABO KAF, Rafeek ABOUD.....	387
BIOPROTECTION OF CUCUMIS MELO FROM <i>ALTERNARIA</i> LEAF SPOT BY <i>GLOMUS MOSSEAE</i> AND <i>TRICHODERMA HARZIANUM</i>	
Abdulnabi Abdul Ameer MATROOD, Abdelhak RHOUMA.....	388
EFFICACY OF FUNGICIDES FOR CONTROL OF POWDERY MILDEW ON GRAPEVINES IN CHOTT SIDI ABDEL SALAM OASIS, TUNISIA	
Abdelhak RHOUMA, Mohammad Imad KHRIEBA, Abdulnabi Abdul Ameer MATROOD	389
ISOLATION AND IDENTIFICATION OF ARBUSCULAR MYCORRHIZAL FUNGI ASSOCIATED WITH <i>ZEA MAYS</i> L. IN THE SYRIAN COAST	
Mohammad Imad KHRIEBA, Abdelhak RHOUMA	390
THE BLACK PARLATORIA SCALE <i>PARLATORIA ZIZIPHI</i> (LUCAS, 1853) (HEMIPTERA: COCCOMPORHA: DIASPIDIDAE): BIOLOGY, CONTROL OPTIONS AND PEST MANAGEMENT APPROACH.	
Hanen JENDOUBI, Pompeo SUMA	391
PEST STATUS OF THE BLACK PARLATORIA SCALE <i>PARLATORIA ZIZIPHI</i> (LUCAS, 1853) (HEMIPTERA: COCCOMPORHA: DIASPIDIDAE)	
Hanen JENDOUBI, Pompeo SUMA	392
INFLUENCE OF ROASTED AND UNROASTED TREATMENTS ON THE FUNCTIONAL PROPERTIES OF WHOLE DURUM WHEAT HARVESTED UNDER TWO TILLAGE SYSTEMS	
Imene KERBOUAI, Khaled SASSI, Hanen BEN ISMAIL.....	393
BIOCONTROL OF <i>RHIZOCTONIA SOLANI</i> USING VOLATILE ORGANIC COMPOUNDS OF SOLANACEAE SEED-BORNE ENDOPHYTIC BACTERIA	
Takwa MARZOUK, Manel CHOUACHI, Ayushi SHARMA, Selim JALLOULI, Ridha MHAMDI, Nutan KAUSHIK, Naceur DJÉBALI	394
LONG-TERM EFFECT OF NEMATICIDAL (ETHOPROPHOS) AND BIOLOGICAL (NOVIBIO) TREATMENTS ON SOIL MICROORGANISM BALANCE	
Najoua NAMOUCHI-KACHOURI, Mohamed Mouldi B'CHIR	395
ON FARM TRIALS CONFIRMING NOVIBIO EFFICACY COMPARED WITH VYDATE ON TOMATO INFESTED BY MELOIDOGYNE JAVANICA	
Najoua NAMOUCHI-KACHOURI, M. M. B'CHIR	396

OPTIMIZATION AND VALIDATION OF MULTI-RESIDUE LC-MSMS METHOD FOR THE ANALYSIS OF PESTICIDES IN CHESNUST	
Gulden HAZARHUN, Aysegul YILDIRIM KUMRAL.....	397
DETERMINATION OF ANTIFUNGAL ACTIVITIES OF WOOD VINEGAR OBTAINED FROM ECALYPTUS AGAINST TOMATO ROOT-ROT AND WILT DISEASE AGENTS	
Aysun UYSAL, Soner SOYLU, Şener KURT, Merve KARA, Emine Mine SOYLU.....	398
THE CHEMICAL CONTROL OF BACTERIAL CANCKER ON CHERRY	
Cansu OKSEL, Mustafa MİRİK	399
AGRICULTURAL PRODUCTS GRADING METHODS AND THEIR ASSOCIATED CHALLENGES	
Geofrey Prudence BAITU, Yeşim Benal ÖZTEKİN, Hüseyin DURAN, Alper TANER.....	400
TECHNOLOGICAL INNOVATIONS IN PESTICIDE APPLICATIONS	
Özbay AKKAŞ, Hüseyin DURAN	401
IMPACT OF MACHINE LEARNING IN AGRICULTURAL RESEARCH	
Mahtem T. MENGSTU, Alper TANER, Yeşim Benal ÖZTEKİN, Hüseyin DURAN.....	402
EXTRACTION METHODS, COMPOSITION AND BIOACTIVE PROPERTIES OF SOME MEDICINAL AND AROMATIC PLANT ESSENTIAL OILS	
Mehmet Musa ÖZCAN, Nurhan USLU	403
ENHANCEMENT OF OXIDATIVE QUALITY OF HEAT TREATED FERMENTED SAUSAGES BY BARBERRY (<i>BERBERIS VULGARIS</i> L.) EXTRACT	
Hülya Serpil KAVUŞAN, Burcu SARI, Hilal CAN, Fatih Mehmet YILMAZ, Meltem SERDAROĞLU.....	404
CHEMICAL COMPOSITION AND ANTIBACTERIAL ACTIVITY OF ESSENTIAL OIL OF MINT PLANT AGAINST SEED-BORNE BACTERIAL DISEASE AGENTS	
Merve KARA, Soner SOYLU, Musa TÜRKMEN.....	405
ISOLATION AND IDENTIFICATION OF PUTATIVE PLANT GROWTH PROMOTING BACTERIAL SPECIES FROM <i>DATURA INOXIA</i> MILL. GROWING IN TURKEY	
Merve KARA, Soner SOYLU, İlhan ÜREMİŞ, Aysun UYSAL, Şener KURT, Emine Mine SOYLU	406
IDENTIFICATION OF <i>XANTHOMONAS CAMPESTRIS</i> PV. <i>CAMPESTRIS</i> ISOLATES CAUSING DISEASE ON CABBAGE IN NİĞDE PROVINCE OF TURKEY	
Murat ÖZTÜRK, Soner SOYLU	407
REMOTE SENSING AND GIS IN AGRICULTURAL PEST INSECT MONITORING: THE STATE OF THE ART IN TURKEY	
Mustafa YAMAN, Şule YAMAN	408

PROTIST PATHOGENS OF INDIAN MEAL MOTH <i>Plodia interpunctella</i> (LEPIDOPTERA: PYRALIDAE) IN TURKEY	
Mustafa YAMAN, Tuğba SAĞLAM, Ömer ERTÜRK	409
EVALUATION OF POPULATION DENSITY OF DIAMOND BACK MOTH, <i>PLUTELLA XYLOSTELLA</i> (L.) (LEPIDOPTERA: YPONOMEUTIDAE) ON CANOLA PLANTS IN HATAY PROVINCE OF TURKEY	
Nihat DEMİREL	410
EVALUATION OF THE DAMAGE RATES OF LEOPARD MOTH, <i>ZEUZERA PYRINA</i> L. (LEPIDOPTERA: COSSIDAE) ON DIFFERENT OLIVE VARIETIES IN TURKEY	
Nihat DEMİREL	411
SEASONAL ABUNDANCE OF <i>EMPOASCA DECIPIENS</i> (PAOLI) AND <i>ASYMMETRASCA DECEDENS</i> (PAOLI), (HEMIPTERA: CICADELLIDAE) ON COTTON PLANTS IN AMIK PLAIN OF HATAY PROVINCE	
Nihat DEMİREL	412
SIDE EFFECTS OF SOME ESSENTIAL OILS ON <i>TUTA ABSOLUTA</i> (MEYRICK, 1917) (LEPIDOPTERA, GELECHIIDAE) LARVAE UNDER LABORATORY CONDITIONS	
Buğse TAŞKIRANOĞULLARI, Nimet SEMA GENÇER	413
APPLICATION OF MACHINE VISION AND IMAGE PROCESSING TECHNIQUES IN ASSESSING THE QUALITY OF NUT PRODUCTS	
Omsalma Alsadig Adam GADALLA, Yeşim Benal ÖZTEKİN, Alper TANER, Hüseyin DURAN	414
DETERMINATION OF SOME PESTICIDE RESIDUES IN FOUR SPECIES OF <i>APIACEAE</i> FAMILY	
Sema DEMİR, Mihriban KORUKLUOĞLU.....	415
DETERMINATION OF ESSENTIAL OIL COMPONENTS, MINERAL MATTER, AND HEAVY METAL OF CLARY SAGE (<i>SALVIA SCLAREA</i> L.) COLLECTED FROM CENTRAL ANATOLIA IN TURKEY	
Tansu USKUTOĞLU, Belgin COŞGE ŞENKAL, Hülya DOĞAN	416
PHYLOGENETIC ANALYSIS OF TWO UKRAINIAN ISOLATES OF CUCUMBER MOSAIC VIRUS FROM GLADIOLI GROWN UNDER DIFFERENT AGROECOLOGICAL CONDITIONS	
Roksolana SOVINSKA, Alina DUNICH, Lidiya MISHCHENKO	417
3. ORGANIC AGRICULTURE	418
CHEMICAL-PHYSICAL PROPERTIES AND QUALITY OF HONEY FROM ORGANIC GROWING FROM THE AREA OF SOUTHERN HERZEGOVINA	
Alma LETO, Belmana GERIN, Alma MIČIJEVIĆ, Svetlana HADŽIĆ, Alisa HADŽIABULIĆ, Aida ŠUKALIĆ	419

CHEMICAL COMPOSITION OF MEDLAR (<i>MESPILUS GERMANICA</i>) AND WILD SERVICE TREE (<i>SORBUS TORMINALIS</i>) – UNDERUTILIZED EDIBLE FRUITS FROM BOSNIA AND HERZEGOVINA	
Srđan LJUBOJEVIĆ, Ladislav VASILJIŠIN, Goran VUČIĆ, Ana VELEMIR	420
CHEMICAL COMPOSITION OF YELLOW GENTIAN ROOT (<i>GENTIANAE RADIX</i>) FROM BOSNIA AND HERZEGOVINA	
Srđan LJUBOJEVIĆ, Ladislav VASILJIŠIN, Goran VUČIĆ, Ana VELEMIR	421
CHICKPEAS AS A VALUABLE RAW MATERIAL IN FULFILLMENT OF THE GOALS OF THE BIOECONOMY	
Daniela TSVYATKOVA, Angel SAROV	422
FUTURE TRENDS FOR DEVELOPMENT OF ORGANIC VINE AND WINE IN BULGARIA	
Desislava TOTEVA	423
COMPARISON OF THE ANTIBACTERIAL POWER OF RAVINTSARA ESSENTIAL OIL (<i>CINNAMOMUM CAMPHORA</i>) IN RELATION TO ITS ORGANIC CERTIFICATION OR CONVENTIONAL	
LAVILLEJ, C. HOTTELART, V. TOUSSAINT, T. FAUDEMÉR, Alex GLINEUR, Steven MASCREZ, Ludovic ANDRES.....	424
SHORT AND LONG TERM EFFECTS OF DIGESTATE FERTILIZATION ON NITROUS OXIDE EMISSIONS IN A FIELD EXPERIMENT IN SOUTHERN GERMANY	
Felizitas WINKHART, Harald SCHMID, Kurt-Jürgen HÜLSBERGEN	425
INNOVATIVE COMBINE HARVESTING AS AN APPROACH FOR INTEGRATED NON-CHEMICAL WEED CONTROL IN CENTRAL HESSEN/ GERMANY	
Philipp KÖLLMANN	426
NITROGEN BALANCES OF DIFFERENT ORGANIC AND CONVENTIONAL FARMING SYSTEMS – RESULTS OF A LONG-TERM EXPERIMENT IN SOUTHERN GERMANY	
Thomas MÖSL, Harald SCHMID, Kurt-Jürgen HÜLSBERGEN.....	427
OENOLOGICAL CHARACTERISTICS AND VINIFICATION RESULTS OF THE YEAST OF MALAGOUSIA GRAPE ISOLATED IN GREECE	
Aikaterini KARAMPATEA, Argirios TSAKIRIS, Ioannis KOURKOUTAS	428
ROLE OF RHIZOBACTERIA IN PLANT DEFENSE SYSTEM	
Riyaz Z. SAYYED.....	429
HALOTOLERANT MICROBIAL CONSORTIA FOR SUSTAINABLE MITIGATION OF SALINITY STRESS; GROWTH PROMOTION, AND MINERAL UPTAKE IN PLANT AND SOIL NUTRIENT ENRICHMENT	
Riyaz Z. SAYYED.....	430

ACILLIBACTIN : A NEW TYPE OF SIDEROPHORE FOR IMPROVEMENT IN PLANT GROWTH AND OIL CONTENT IN SESAME	
Riyaz Z. SAYYED, Sundaram LALITHA, M. S. REDDY	431
INTERLINKING BIO-PRIMING APPROACH WITH INTEGRATED NUTRIENT MANAGEMENT FOR IMPROVED NUTRIENT USE EFFICIENCY IN CROP SPECIES	
Riyaz Z. SAYYED.....	432
EFFECT OF EXOGENOUS PUTRESCINE ON WINTER OILSEED RAPE RESPONSE TO LOW TEMPERATURE	
Elžbieta JANKOVSKA-BORTKEVIČ, Sigita JURKONIENĖ, Virgilija GAVELIENĖ, Rima MOCKEVIČIŪTĖ, Jurga JANKAUSKIENĖ, Dessislava TODOROVA, Iskren SERGIEV, Valdas VILUCKAS, Petras PRAKAS	433
EFFECT OF PROBIOTIC COMPOSITIONS ON GROWTH, ANTIOXIDANT ACTIVITY AND PRODUCTIVITY OF BEETROOT	
Božena ŠOCIK, Sigita JURKONIENĖ, Virgilija GAVELIENĖ, Elžbieta JANKOVSKA-BORTKEVIČ	434
EFFECTS INDUCED BY THE PROBIOTICS ON ANTIOXIDANT POTENTIAL OF BLACKCURRANT BERRIES	
Sigita JURKONIENĖ, Virgilija GAVELIENĖ, Rima MOCKEVIČIŪTĖ, Jurga JANKAUSKIENĖ, Elžbieta JANKOVSKA-BORTKEVIČ, Vaidevutis ŠVEIKAUSKAS.....	435
ORGANIC AGRICULTURE FOR ECOLOGICAL BALANCE: THE CASE STUDY OF NEPAL	
Megha RAJ REGMI.....	436
RESPONSE OF GROUNDNUT TO RHIZOBIUM INOCULATION IN TWO AGRO ECOLOGICAL ZONES OF NORTHERN NIGERIAN SAVANNAH	
Abdulkadir N. A., Ewusi-Mensah, N., Opuko , A. , Yusuf A. A, Malamine Thioub , Adamu, U. K. , Almu, H., Sani, A. , Muhammad, A. A., Hayatu, B. Ahmad, U. B', Lamido, A. K. Adam, I., Aliyu, R. W., Jibrin H. J.	437
NITROGEN TRANSFORMATIONS AND MAIZE GROWTH IN RESPONSE TO NITRIFICATION INHIBITORS AND PEANUT STRAW BIOCHAR	
Khalid MEHMOOD, Majid MAHMOOD TAHIR, Muhammad AQEEL KAMRAN, M. ABDULAHA-AL BAQUY, Ren-yong SHI, Ren-kou XU.....	438
CYANOBACTERIA-PLANT INTERACTION: ASSOCIATIVE NITROGEN FIXATION AND AUXIN PRODUCTION BY <i>LEPTOLYNGBYA</i> AND ENHANCED GROWTH OF <i>VIGNA RADIATA</i>	
Mehboob AHMED.....	439
MYCORRHIZAL INOCULATION ENHANCED TILLERING IN FIELD GROWN WHEAT, NUTRITIONAL ENRICHMENT AND SOIL PROPERTIES	

Muhammad AKBAR, Safeer Akbar CHOHAN, Nasim Ahmad YASIN, Aqeel AHMAD, Waheed AKRAM, Nazir ASLAM, Muhammad Sajjad IQBAL, Tayyaba KHALIL	440
SOIL AND ITS MICROORGANISMS: A CASE STUDY FOR SUSTAINABLE AGRICULTURAL PRODUCTION UNDER PAKISTAN'S CLIMATIC CHANGE CONDITIONS	
Noshin ILYAS	441
CONTENT OF SELECTED ANTIOXIDANT COMPOUNDS IN RAW MILK PRODUCED ON A CERTIFIED ORGANIC FARM AND IN YOGHURT MADE FROM IT	
Aneta BRODZIAK, Jolanta KRÓL, Joanna WAJS, Barbara TOPYŁA.....	442
RESEARCH ON THE USE OF COVER CROPS FOR THE CONTROL OF DISEASES AND PESTS IN ORGANIC VINEYARDS	
Aurora RANCA, Anamaria PETRESCU, Ionica DINA, Sergiu Ayar ENE, Victoria ARTEM.....	443
VALORIZATION OF WINE AND MARINE BY-PRODUCTS AS POTENTIAL ORGANIC FERTILIZERS IN GRAPEVINE CULTURE	
Victoria ARTEM, Aurora RANCA, Anil ABDURAMAN, Madalina-Andreea CIOCAN, Ticuta NEGREANU-PIRJOL.....	444
HUMIC ACIDS COMPOSITION OF ARABLE SOD-PODZOLIC SOIL AFTER LONG-TERM APPLICATION OF TRADITIONAL AND UNCONVENTIONAL ORGANIC FERTILIZERS	
Nina E. ZAVYALOVA, Marina T. VASBIEVA	445
MODELING OF THE PRODUCTION PROCESS OF SPRING GRAIN CROPS TO IMPROVE ORGANIC PRODUCTION IN URBAN FARMING	
Alexandrov NIKITA ALEXANDROVICH.....	446
SMART LAND MANAGEMENT AND ORGANIC AGRICULTURE IN BELARUS	
Vasily NILIPOVSKIY, Olga PISETSKAYA.....	447
CHARACTERIZATION OF COLORED MAIZE SEED FRACTIONS USING FLUORESCENCE SPECTROSCOPY AND MULTIVARIATE ANALYSIS	
Dragana BARTOLIĆ, Miloš PROKOPIJEVIĆ, Mira STANKOVIĆ, Ksenija RADOTIĆ	448
THE STATE OF ORGANIC GRAIN PRODUCTION IN SERBIA	
Jelena GOLIJAN, Mile SEČANSKI, Bojan DIMITRIJEVIĆ	449
SOME INDICATORS OF ORGANIC PRODUCTS EXPORT FROM THE REPUBLIC OF SERBIA	
Marija POPOVIĆ, Sreten JELIĆ	450
THE INFLUENCE OF ORGANIC FERTILIZERS ON THE SEED YIELD AND SEED QUALITY OF BUTTERNUT SQUASH (<i>CUCURBITA MOSCHATA</i>) GROWN ON DIFFERENT TYPES OF SOIL	

Milan UGRINOVIĆ, Zdenka GIREK, Suzana PAVLOVIĆ, Slađan ADŽIĆ, Jelena DAMNJANOVIĆ, Marija GAVRILOVIĆ, Vladan UGRENOVIĆ	451
DRY BEAN PRODUCTION IN THE FIRST DECADES OF THE 21ST CENTURY: REPUBLIC OF SERBIA	
Milan UGRINOVIĆ, Zdenka GIREK, Suzana PAVLOVIĆ, Slađan ADŽIĆ, Dejan CVIKIĆ, Đorđe MORAVČEVIĆ, Almir MUHOVIĆ	452
THE IMPORTANCE OF APPLYING ORGANIC PREPARATIONS IN THE PEPPER PRODUCTION	
Marina STANIĆ, Nenad PAVLOVIĆ, Jelena MLADENOVIĆ, Anđelka POPADIĆ, Milena ĐURIĆ	453
THE INFLUENCE OF SOME BIO-PRODUCTS ON GERMINATION AND PROTECTION OF <i>CHAMOMILLA RECUTITA</i> (L.) RAUCH SEEDS	
Vladimir FILIPOVIC, Sara MIKIC, Vladan UGRENOVIC, Tatjana MARKOVIC, Zeljana PRIJIC, Snezana MRĐAN, Stefan GORDANIC.....	454
IS THERE ANY EFFECTS OF ORGANIC FOOD ON HUMAN HEALTH?	
Snežana OLJAČA, Željko DOLIJANOVIĆ, Dušan KOVAČEVIĆ, Jasmina OLJAČA, Nemanja GRŠIĆ	455
VARIABILITY OF PLANT HEIGHT AND SPIKE CHARACTERISTICS OF DURUM WHEAT GROWING IN ORGANIC PRODUCTIONS	
Veselinka ZEČEVIĆ, Slobodan MILENKOVIĆ, Danica MIĆANOVIĆ, Kristina LUKOVIĆ, Mirela MATKOVIĆ STOJŠIN, Radiša ĐORĐEVIĆ, Desimir KNEŽEVIĆ	456
EFFECT OF CROPPING SYSTEMS AND PLANT NUTRITION ON PRODUCTIVITY AND RHEOLOGICAL QUALITY OF WINTER WHEAT	
Magdaléna LACKO-BARTOŠOVÁ, Lucia LACKO-BARTOŠOVÁ, Matej HUDEC, Joanna KORCZYK-SZABÓ	457
PRODUCTION PARAMETERS AND ECONOMIC PERFORMANCE OF WINTER WHEAT GROWN IN ORGANIC SYSTEM	
Magdaléna LACKO-BARTOŠOVÁ, Lucia LACKO-BARTOŠOVÁ, Matej HUDEC	458
ALTERNATIVE FOR POLYPROPYLENE BAGS IN OYSTER MUSHROOM (<i>PLEUROTUS OSTREATUS</i>) CULTIVATION IN SRI LANKA.	
I.J.A. RUHUNUGE, J. P. KIRTHISINGHE.....	459
USE OF ANIMAL DUNG FOR CULTIVATION OF OYSTER MUSHROOM (<i>Pleurotus ostreatus</i>) IN SRI LANKA	
I.J.A RUHUNUGE, JP KIRTHISINGHE.....	460
ORGANIC FARMING AND POLICIES APPLIED IN TURKEY	
Aybüke KAYA	461

4. ENVIRONMENT PROTECTION AND NATURAL RESOURCES MANAGEMENT.....462

BIODIVERSITY OF THE ENTOMOFAUNA OF AN ORANGERY IN EL-DJOURMOURIA (EUCALYPTUS, ALGIERS)

Ilham BENABBAS- SAHKI, Kamel HAMADI, Salaheddine DOUMANDJI 463

PARASITIC NEMATODES OF VEGETABLE CROPS IN SOME REGIONS OF MITIDJA (ALGERIA)

Ilham BENABBAS- SAHKI, Kamel HAMADI, Faiza MARNICHE..... 464

EFFECT OF FUNGAL TREATMENT BY SOLID STATE FERMENTATION ON THE NUTRITIONAL VALUE OF OLIVE POMACE

Nabila BELHAMICHE, Alia AISSAT, Siham AZIBI 465

STUDY OF DROUGHT TREND AND ITS CORRELATION WITH NORMALIZED DIFFERENCE VEGETATION INDEX OVER SETIF REGION IN ALGERIA

Tarek BOUREGAA 466

CSR STRATEGIES OF INVASIVE WEED FLORA IN VINEYARDS OF BOSNIA AND HERZEGOVINA

Antonela MUSA, Danijela PETROVIĆ, Samir ĐUG , Helena BREKALO Ivan OSTOJIĆ..... 467

TEMPORARY AND PERMANENT WET ZONES IN BOSNIA AND HERZEGOVINA

Branislav DRAŠKOVIĆ, Aleksandar PONOSOV, Natalia ZHERNAKOVA 468

WEED FLORA OF ARABLE CROPS IN HERZEGOVINA REGION (BOSNIA AND HERZEGOVINA)

Danijela PETROVIĆ, Mate BOBAN, Antonela MUSA, Helena BREKALO, Ivan OSTOJIĆ 469

PROMOTING THE APPLICATION OF SMART TECHNOLOGIES (CLOUD-BASED AND REMOTE SENSING) IN AGRICULTURAL WATER MANAGEMENT IN BOSNIA AND HERZEGOVINA

Mihajlo MARKOVIĆ, Nataša ČEREKOVIĆ, Đurađ HAJDER, Nery ZAPATA, Teresa A. PAÇO, Erminio EFISIO RIEZZO, Sabrija ČADRO, Mladen TODOROVIĆ 470

ANTIBACTERIAL ACTIVITY OF MANUKA HONEY WITH DIFFERENT MANUKA FACTOR

Vesna KALABA, Tanja ILIĆ, Željko SLADOJEVIĆ, Bojan GOLIĆ 471

ANTIMICROBIAL PROPERTIS OF ESSENCIAL OILS AGAINST ESCHERICHIA COLI

Vesna KALABA, Tanja ILIĆ, Željka MARJANOVIĆ BALABAN..... 472

THE BULGARIAN MODEL OF LAND OWNERSHIP: THE "WHITE SPACE" PHENOMENON

Diana KOPEVA, Angel SAROV 473

PLANT HEALTH FOR LOCAL CLIMATE REGULATION IN URBAN AREAS IN THE EASTERN RHODOPE

Stelian DIMITROV, Bilyana BORISOVA, Miglena ZHIYANSKI, Georgi GEORGIEV, Margarita GEORGIEVA, Martin ILIEV, Lidia SEMERDJIEVA, Kalina RADEVA 474

RESPONSE OF YIELD AND QUALITY OF TOMATO GROWN IN UNHEATED GREENHOUSE TO IRRIGATION AND FERTILIZATION WITH DIFFERENT RATES

Galina PATAMANSKA, Ivanka MITOVA, Daniela MITEVA, Antoaneta GIGOVA..... 475

ANALYSIS AND ASSESSMENT OF THE STATE OF BURGAS URBAN ECOSYSTEMS (BULGARIA) TO MAINTAIN NURSERY POPULATIONS AND HABITATS

Lidiya SEMERDZHIEVA, Bilyana BORISSOVA 476

ASSESMENT OF THE DIVERSITY AND DISTRIBUTION OF HONEY PLANTS BY HABITATS IN THE CENTRAL PARTS OF KRIVODOL MUNICIPLAITY (NORHERN BULGARIA)

Nikolay NIKOLOV, Borislav GRIGOROV, Kiril VASSILEV, Momchil NAZUROV 477

OVERVIEW AND PACKAGE ACTIVITIES PERFORMED OF NATIONAL RESEARCH PROGRAM "ENVIRONMENTAL PROTECTION AND REDUCTION OF ADVERSE EVENTS AND NATURAL DISASTERS' RISKS"

Velimira STOYANOVA, Boian KOULOV, Bilyana BORISOVA, Nikolay RACHEV 478

UTILIZATION OF BOTTOM ASH FOR THE RECLAMATION OF DISTURBED TERRAINS

Petyr PETROV, Veneta STEFANOVA..... 479

CHEMICAL COMPOSITION OF ESSENTIAL OIL OF WILD THYME GROWN ON SERPENTINE SOILS IN BULGARIA

Violina ANGELOVA..... 480

PARENT MATERIAL AS A KEY DETERMINANT OF SOIL PROPERTIES IN SOUTHERN PART OF NATIONAL PARK KRKA, CROATIA

Aleksandra BENSA, Mirna ŠVOB, David DOMÍNGUEZ-VILLAR, Dražen PERICA, Kristina KRKLEC..... 481

THE IMPACT OF LAND USE AND CLIMATE CHANGE ON EROSION PROCESSES AND THEIR MITIGATION FROM LANDSCAPE PERSPECTIVE

Bořivoj ŠARAPATKA, Marek BEDNÁŘ..... 482

EFFECT OF SELECTED ESSENTIAL OILS ON ACUTE MORTALITY OF *VARROA DESTRUCTOR*

Marian HÝBL, Petr MRÁZ, Alena VANIČKOVÁ..... 483

RISK SPATIALIZATION OF AGRICULTURAL PHYTOSANITARY PRACTICES: CASE STUDY IN SOUTH-WEST FRANCE

Chaima GRIMENE, Oussama MGHIRBI, Philippe LE GRUSSE, Jean-Paul BORD 484

ETOPHY: WEB PLATFORM FOR MANAGING THE IMPACTS OF PLANT PROTECTION PRODUCTS USED IN AGRICULTURE

Oussama MGHIRBI, Philippe LE GRUSSE, Chaima GRIMENE, Elisabeth MANDART, Jacques FABRE, Julie CAUBEL, Isabelle NEMBROT, Jean Philippe BOULANGER, Jean-Paul BORD .. 485

NUTRITIVE VALUE OF RIPARIAN COMMON REED BIOMASS FOR RUMINANTS

Fokion PAPATHANASIOU, Konstantinos ZARALIS, Irene KOUTSERI, Myrsini MALAKOU, Angelos PAPADOPOULOS Anastasia PLIANTSA, Marialena AGGELAKI, Vasiliki KARETSA, Ioannis PAPADOPOULOS 486

ASSESSING THE POTENTIAL USE OF GFS-ANL MODEL WEATHER DATA IN FIELD-SCALE PRECISION AGRICULTURE IMPLEMENTATION

George ARAMPATZIS, Evangelos HATZIGIANNAKIS, Vassilios PISINARAS, Charalampos DOULGERIS, Evangelos TZIRITIS, Ioannis TSAKMAKIS 487

MOLECULAR CHARACTERIZATION OF GREEK SWEET CHERRY LANDRACES (*PRUNUS AVIUM* L.) USING MICROSATELLITE MARKERS

Dimitra DIMOU, Georgios PATAKIOUTAS, Ioannis GANOPOULOS, Dimitrios KYRKAS, Paraskevi YFANTI, Nikolaos MANTZOS, Ioannis MANTHOS, Nikolaos NIKISIANIS, Eleni MALOUPA 488

DECISION SUPPORT SYSTEM FOR WASTEWATER AND BIOSOLIDS SAFE REUSE IN AGRICULTURAL APPLICATIONS

Spyridon S. KYRITSIS, Prodromos H. KOUKOULAKIS, Ioannis K. KALAVROUZIOS 489

SOIL INORGANIC NITROGEN AND COTTON YIELD SIMULATION USING THE CropSyst MODEL: A PRELIMINARY CASE STUDY IN GREECE

Maria KOKKORA, Panagiota KOUKOULI, Pantazis GEORGIU, Dimitrios KARPOUZOS, Fotis BILIAS, Dionisios GASPARATOS 490

POTENTIAL FOR REUSE OF THE DRAINAGE WATER IN HYDROPONIC CULTIVATIONS OF TOMATO PLANTS

Pavlos TOURSIDIS, Petros GIKAS 491

VULNERABILITY ASSESSMENT OF SOIL SALINIZATION BY IRRIGATION WITH SALINE WATER. APPLICATION IN THE COASTAL AREA OF RHODOPE, NE GREECE

Vassilis ASCHONITIS, Evangelos TZIRITIS, Giorgos ARAMPATZIS, Paschalis DALAMPAKIS, Charis DOULGERIS, Andreas PANAGOPOULOS, Vassilios PISINARAS, Katerina SACHSAMANOGLU, Evangelos HATZIGIANNAKIS 492

SUSTAINABILITY YIELD INDEX AND YIELD TRENDS OF WHEAT CROP IN LONG-TERM FERTILITY EXPERIMENT UNDER MAIZE-WHEAT SYSTEM

Neha SHARMA, Narender KUMAR SANKHYAN, Anjali SABHARWAL, Raj PAL SHARMA 493

BHILWA (*SEMELICARPUS ANACARDIUM*) - IMPORTANT TREE

Dipika AYATE, Shedage SWATI, Garima GUPTA, Pankaj LAVANIYA, M. J. DOBRIYAL, A. K. PANDEY 494

EVALUATION OF WINTER WHEAT YIELD USING SATELLITE IMAGERY Maziar FARZINBEH, Hassan MAKARIAN, Rozbeh MOAZENZADEH, Hamid ABASDOKHT	495
CLIMATE CHANGE AND FOOD SECURITY: A REVIEW ON CHALLENGES AND OPPORTUNITIES FACED FARMING SYSTEMS IN ARID REGIONS Mohsen JAHAN, Shiva GHALENOEI.....	496
ENERGY CONSUMPTION AND FOOD PRICE: A QUANTILE REGRESSION APPROACH ON IRANIAN DATA Reza MOGHADDASI, Nemat MOUSAVI	497
NEXUS BETWEEN ENERGY CONSUMPTION AND AGRICULTURAL INFLATION: IRANIAN EXPERIENCE Reza MOGHADDASI, Niyooosha NARAGHI.....	498
THE REMEDIATION POTENTIAL FOR PAHS OF <i>VERBASCUM SINUATUM</i> L. COMBINED WITH AN ENHANCED RHIZOSPHERE LANDSCAPE: A FULL-SCALE MESOCOSM EXPERIMENT Alessia POSTIGLIONE, Daniela ZUZOLO, Rosaria SCIARRILLO, Carmine GUARINO	499
BIOMASS-WASTE DERIVED PROTEIN HYDROLYSATES THROUGH PROTEOLYTIC ENZYMES IMMOBILIZED ON BIOPOLYMERIC SUPPORTS Alessio CESARETTI, Nicolò MONTEGIOVE, Eleonora CALZONI, Roberto Maria PELLEGRINO, Leonardo LEONARDI, Carla EMILIANI	500
SUSTAINABLE USE OF PLANT PROTECTION PRODUCTS IN <i>NATURA 2000</i> AREAS: MITIGATION OF IMPACTS AND BIODIVERSITY CONSERVATION Carlo Maria CUSARO, Carolina GRAZIOLI, Alessio NOVELLA, Sofia GIGLIOTTI, Tamara TEDESCHI, Lorenzo RAMPINI, Daniele RATTINI, Tiziano POZZI, Maura BRUSONI.....	501
PLANT-SOIL-MICROBIOTA COMBINATION FOR THE REMOVAL OF TOTAL PETROLEUM HYDROCARBONS (TPH): AN IN-FIELD EXPERIMENT Daniela ZUZOLO, Guarino CARMINE, Maria TARTAGLIA, Sciarillo ROSARIA	502
MIXED MICROBIAL AND THERMAL DEGRADATION OF AGRICULTURAL DERIVED PLANT WASTES Eleonora CALZONI, Alessio CESARETTI, Nicolò MONTEGIOVE, Roberto Maria PELLEGRINO, Leonardo LEONARDI, Carla EMILIANI	503
EFFECTS OF A MICROBIAL CONSORTIUM ON <i>SCHEDONORUS ARUNDINACEUS</i> IN A PLURICONTAMINATED SOIL Maria Antonietta RANAUDA, Maria TARTAGLIA, Daniela ZUZOLO, Antonello PRIGIONIERO, Maria MAISTO, Alessia POSTIGLIONE, Pierpaolo SCARANO, Rosaria SCIARRILLO, Carmine GUARINO	504
PERFORMANCE OF A PILOT-SCALE CONSTRUCTED WETLAND SYSTEM AND REUSE OF TREATED WASTEWATER IN AGRICULTURAL IRRIGATION	

Mario LICATA, Salvatore LA BELLA, Teresa TUTTOLOMONDO, Davide FARRUGGIA	505
IN VITRO METHANOGENIC FERMENTATION INHIBITED BY DIFFERENT EXTRACTS OF <i>HYPOESTES FORSSKAOLII</i> (VAHL) R. BR. (ACANTHACEAE) LEAVES	
Massimiliano D'AMBOLA, Alessandro VASTOLO, Marcello SCIVICCO, Monica I. CUTRIGNELLI, Lorella SEVERINO, Serena CALABRÒ	506
PROTEIN AND AMINO ACID PROFILE ANALYSIS OF AGRI-FOOD WASTE BIOMASSES	
Nicolò MONTEGIOVE, Eleonora CALZONI, Alessio CESARETTI, Roberto Maria PELLEGRINO, Leonardo LEONARDI, Carla EMILIANI	507
SUGGESTED SOLUTIONS FOR WATER PROBLEM IN LIBYA	
Ehdadan Jamal ALI MOHAMED.....	508
EFFECTIVENESS OF DIGESTATE FERTILIZATION ON SOIL MICROBIAL ACTIVITY AND GREENHOUSE GAS EMISSIONS	
Modupe DOYENI, Skaidrē SUPRONIENE, Vita TILVIKIENE.....	509
MODELING SUSTAINABLE ENTREPRENEURSHIP IN THE COVID-19 ERA	
José Maros BUSTOS-AGUAYO, Margarita JUAREZ-NAJERA, Francisco ESPINOZA-MORALES, Cruz GARCÍA-LIRIOS, Javier CARREÓN-GUILLÉN, Jorge HERNANDEZ-VALDES.....	510
GENETIC PECULIARITIES OF BROWN SOILS IN NATURAL AND ANTHROPOGENIC ECOSYSTEMS OF MOLDOVA	
Tamara LEAH, Valerian CERBARI, Yuri ROZLOGA, Vladimir FILIPCIUC	511
SOIL PROTECTION, AN ISSUE FOR AGRICULTURAL DEVELOPMENT: CASE OF MOROCCO	
Jilali BEN DRISS.....	512
DESIGN AND STUDY OF AN INNOVATIVE PASSIVE SOLAR HEATING LAHOSYSTEM INSTALLED IN MULTI-SPAN GREENHOUSE	
Lahoucine GOURDO, Hicham FATNASSI, Rachid BOUHARROUD, Ahmed WIFAYA, Hassan DEMRATI, Ahmed BEKKAOUI, Ahmed AHAROUNE, Lahen BOUIRDEN , Khadija ACHGAR, Ahmed CHRAIBI	513
AN ASSESSMENT OF THE PUBLIC-PRIVATE PARTNERSHIP POLICY AROUND AGRICULTURAL LAND IN MOROCCO	
Meriem EL KOUHEN	514
ENTREPRENEURIAL INNOVATION AND SUSTAINABLE FOREST MANAGEMENT: THE CASE OF IFRANE REGIONAL NATURAL PARK IN MOROCCO	
Mustapha OUATMANE, Jilali BENDRISS	515
LABELING OF LOCAL PRODUCTS FOR LOCAL DEVELOPMENT AND PROTECTION OF BIODIVERSITY	

Mustapha OUATMANE, Jilali BENDRISS	516
INTEGRATED NUTRIENTS MANAGEMENT IN FIELD CROPS PRODUCTION: A BEST WAY FOR SUSTAINABLE SOIL MANAGEMENT IN CHANGING CLIMATE	
Amanullah KHAN	517
AN ANALYSIS OF ECOLOGICAL FOOTPRINT IN RURAL URBAN AREAS OF DISTRICT SWAT, KHYBER PAKHTUNKHWA (PAKISTAN)	
Anwar HUSSAIN, Umar HAYAT	518
IMPACT OF UNTREATED SLAUGHTERHOUSE EFFLUENT ON THE ACCUMULATION AND UPTAKE OF ZN, NI, AND CD BY RICE (<i>ORYZA SATIVA</i> L.) CROP	
Ateeba SEHAR, Hamaad Raza AHMAD, Muhammad SABIR.....	519
POTENTIAL ANTIMICROBIAL COMPOUNDS IN FLOWER EXTRACT OF <i>PLUMERIA ALBA</i>	
Malik F. H. FERDOSI, Aroosa AFZAL, Muhammad KALEEM NASEEM, Iqra HAIDER KHAN, Arshad JAVAID.....	520
NUTRIENT USE EFFICIENCY OF CHILIES PLANTS CULTIVATED WITH ACIDIFIED IRRIGATION WATER	
Muneeb HASHMI, Muhammad SHAFIQ, Rashid MEHMOOD	521
PROTECTIVE POTENTIAL OF PLANTS OF DEOSAI PLAINS AFTER 1ST WAVE OF COVID-19	
Sumaira SAHREEN.....	522
A MELIORATIVE EFFECTS AND SOIL CARBON SEQUESTRATION POTENTIAL OF ORGANIC AND IN-ORGANIC AMENDMENTS IN SALT-AFFECTED SOILS IN A SEMI-ARID REGION OF ASIA	
Zia Ur Rahman FAROOQI, Muhammad SABIR, Hamaad Raza AHMAD, Muhammad ARFAN .	523
THE INFLUENCE OF RAILWAY JUNCTION ZDUŃSKA WOLA – KARSZNICE (CENTRAL POLAND) ON THE CONTENT OF TRACE METALS IN SURFACE LEVELS OF SOILS	
Ilona TOMCZYK-WYDRYCH, Anna ŚWIERCZ.....	524
MANURE APPLICATION AS A SOURCE OF MICROBIAL AND CHEMICAL POLLUTANTS IN THE ENVIRONMENT	
Ewa KORZENIEWSKA, Martyna BUTA, Wiktor ZIELIŃSKI, Jakub HUBENY, Damian ROLBIECKI, Monika HARNISZ.....	525
CHANGES IN THE <i>EUSTIGMATOS MAGNUS</i> FATTY ACID PROFILE SUITABLE FOR BIODIESEL PRODUCTION	
Izabela KRZEMIŃSKA, Wioleta BABIAK, Agata PIASECKA	526

IDENTIFICATION OF BACTERIA AFFECTING WHITE MULBERRY (MORUS ALBA) IN POLAND

Małgorzata ŁOCHYŃSKA, Krzysztof KRAWCZYK, Jakub FRANKOWSKI 527

THE OCCURRENCE AND DIVERSITY OF BETA-LACTAMASE GENES DURING WASTEWATER TREATMENT

Jakub HUBENY, Sławomir CIESIELSKI, Monika HARNISZ, Ewa KORZENIEWSKA, Tomasz DULSKI, Łukasz JAŁOWIECKI, Grażyna PŁAZA 528

ANALYZES OF THE ENVIRONMENTAL BIOFILM

Tomasz CŁAPA, Dorota NAROŻNA, Damian NIKODEM, Jakub MICHALSKI..... 529

APPLICABILITY OF BACTERIAL NANOCELLULOSE

Dimitrie STOICA, Angela-Stela IVAN, Alina-Mihaela CANTARAGIU, Maricica STOICA 530

DETERMINATION OF ORGANOCHLORINE PESTICIDES IN SURFACE WATER FROM TIMIȘ AND SIBIU COUNTIES IN ROMANIA

Mădălina Maria JURCOVAN, Răzvan COTIANU, Mihaela PÎRVULESCU 531

EUROPEAN LAND ABANDONMENT AND HOW A MORE DETAILED FOREST DEFINITION CAN HELP

Richard RIMOLI..... 532

EVEN THOUGH THERE IS SUCH BENEFIT, THERE ARE HUMAN-MADE DISRUPTIVE CHANGES

Solomon MELAKU MELESE, Vasenev IVAN IVANOVICH 533

AGRICULTURAL DROUGHTS AS EXTREMELY LONG PERIODS WITHOUT RAINFALL IN VOJVODINA PROVINCE, SERBIA

Bojan SRĐEVIĆ, Zorica SRĐEVIĆ, Pavel BENKA 534

COMPARISON OF CELL WALL STRUCTURE OF DIFFERENT WESTERN BALKAN PLANT SPECIES AS A SOURCE FOR BIOFUELS

Daniela DJIKANOVIĆ, Ksenija RADOTIĆ, Aleksandar DEVEČERSKI, Gjozo GARAB, Gabor STEINBACH 535

THE INFLUENCE OF ALKALINE HYDROLYSIS CONDITIONS ON THE ISOLATION OF HEPARIN FROM THE PORCINE INTESTINAL MUCOSA

Jelena MILANOVIC, Marko MALICANIN, Marija MILADINOVIĆ, Aleksandar MILETIĆ, Sasa OBRADOVIĆ, Biljana AN ELIĆ, Sanja MARKOVIĆ 536

GEOGRAPHICAL ORIGIN OF ALIEN INVASIVE FISH SPECIES IN SERBIA

Milan GLIŠIĆ, Biljana DELIĆ VUJANOVIĆ 537

THE VALORIZATION OF EDIBLE INDUSTRIAL WASTE IN FOOD PRODUCTION

Milenko KOSUTIĆ..... 538

CHARACTERIZATION OF FUNGAL ISOLATES FROM DIFFERENT TYPES OF SOIL AND THEIR ABILITY TO DEGRADE CELLULOTIC ORGANIC MATTER Simonida DJURIC, Timea HAJNAL-JAFARI, Dragana STAMENOV, Vladimira SEMAN, Biljana NAJVIRT, Nataša DOŠEN	539
ECOLOGICAL AND ECOPHYSIOLOGICAL BASES OF BIOLOGICAL MONITORING Slaviša MILOŠEVIĆ, Predrag JAKŠIĆ	540
HUMUS CONTENT IN SERBIA TO THE MAPPING INVESTIGATED PITCH Snezana JANKOVIC, Divna SIMIC, Sladjan STANKOVIC, Dragan RAHOVIC, Vera POPOVIC, Vuk RADOJEVIC, Jela IKANOVIC	541
URBAN GREENERY RESEARCH: LEARNING TRENDS FROM THE PAST DECADE Snežana POPOV, Zlata MARKOV RISTIĆ, Boris POPOV	542
SURVIVAL OF MICROORGANISMS IN CRUDE OIL POLLUTED SOIL Timea HAJNAL JAFARI, Dragana STAMENOV, Simonida ĐURIĆ	543
INFLUENCE OF ENVIRONMENTAL FACTORS ON INSECT POLLINATORS IN NORTHERN SERBIA Zlata MARKOV RISTIĆ, Dušanka VUJANOVIĆ	544
RASPBERRY PRODUCTION AND ECONOMIC VALUE OF INSECT POLLINATION OF RASPBERRY IN SERBIA Zlata MARKOV RISTIĆ, Snežana POPOV	545
STATUS AND SWOT ANALYSIS OF DEER POPULATION MANAGEMENT AT THE HUNTING GROUNDS IN CENTRAL SERBIA Zoran POPOVIĆ, Stefan STEPIĆ, Mladen POPOVAC, Vukan LAVADINOVIĆ	546
HOW ECOSYSTEM SERVICES OF THE FLOODPLANS CAN CONTRIBUTE TO THE BETTER WATER QUALITY IN THE DANUBE REGION: IDES PROJECT Zorica SRĐEVIĆ, Pavel BENKA, Jasna GRABIĆ, Bojan SRĐEVIĆ, Nenad ANTONIĆ, Milica ILIĆ, Senka ŽDERO	547
ACTIVITY OF SOIL MICROBIAL COMMUNITY AS AN INDICATOR OF PLANT SPECIES INVASION ON SOIL ECOSYSTEM Lenka BOBULSKÁ, Lenka DEMKOVÁ, Marek RENČO, Andrea ČEREVKOVÁ	548
MERCURY POLLUTION IN FORMER MINING AREA (SLOVAKIA) AND THEIR INFLUENCE ON BIOLOGICAL AND CHEMICAL SOIL PROPERTIES Lenka DEMKOVÁ, Lenka BOBULSKÁ, Július ÁRVAY	549
ENVIRONMENTAL MANAGEMENT OF LIVESTOCK IN BOSNIA AND HERZEGOVINA ON THE EXAMPLE OF ENVIRONMENTAL PERMITS Aleksandar ŠOBOT, Diana BILIĆ-ŠOBOT	550

TRENDS IN EVAPOTRANSPIRATION IN THE SOUTHWEST OF THE IBERIAN PENINSULA, IN THE CONTEXT OF GLOBAL WARMING

Abelardo GARCÍA-MARTÍN, Luis L.PANIAGUA, Fulgencio HONORIO, Francisco J. MORAL, Francisco J. REBOLLO, Virginia ALBERDI..... 551

CHARACTERIZATION OF PHOTOSYNTHETIC ACTIVE RADIATION IN BURGOS

Ana GARCIA-RODRIGUEZ, Sol. GARCIA-RODRIGUEZ, Manuel GARCÍA-FUENTE, Diego GRANADOS-LÓPEZ, David GONZÁLEZ-PEÑA 552

MODIFICATION OF ENZYME ACTIVITIES IMMEDIATELY AFTER CONVERSION OF A MEADOW TO A FODDER MAIZE CROP

Carmen TRASAR-CEPEDA, Serafin GONZÁLEZ-PRIETO, Ángeles PRIETO-FERNÁNDEZ .. 553

SPATIAL ANALYSIS OF ARIDITY DURING GRAPEVINE GROWING SEASON IN eXTREMADURA, SOUTHWESTERN SPAIN

Cristina AGUIRADO, Luis L. PANIAGUA, Francisco J. MORAL, Francisco J. REBOLLO, Abelardo GARCÍA-MARTÍN, Fulgencio HONORIO, Virginia ALBERDI..... 554

ANALYSIS OF THE EVOLUTION OF VINEYARD AREA IN EXTREMADURA (SOUTHWESTERN SPAIN) USING A GIS-BASED APPROACH. IS IT INFLUENCED BY CLIMATIC CHANGE?

Francisco J. REBOLLO, Francisco J. MORAL, Virginia ALBERDI, Luis L. PANIAGUA, Abelardo GARCÍA-MARTÍN, Cristina AGUIRADO 555

DELINEATION OF MANAGEMENT ZONES ON GRAZED PERMANENT PASTURES BASED ON THE RASCH MODEL

Francisco J. MORAL, Francisco J. REBOLLO, Virginia ALBERDI, Abelardo GARCÍA-MARTÍN, Luis L. PANIAGUA, Cristina AGUIRADO, Joao M. SERRANO 556

SUSTAINABLE REMOVAL OF COPPER-OXYCHLORIDE BY CALCIUM ALGINATE BIOPOLYMERS

José Manuel CRUZ, Andrea MARTÍNEZ-ARCOS, Alejandro LÓPEZ-PRIETO, Benita PÉREZ-CID, Xanel VECINO, Ana Belén MOLDES 557

ANALYSIS OF TEMPORAL TRENDS FOR DAYS WITH OPTIMUM TEMPERATURES FOR GRAPEVINE GROWING IN THE RIBERA DEL GUADIANA DENOMINATION OF ORIGIN (SPAIN)

Luis L. PANIAGUA, Francisco J. MORAL, Francisco J. REBOLLO, Abelardo GARCÍA-MARTÍN, Fulgencio HONORIO, Virginia ALBERDI, Cristina AGUIRADO 558

POTENTIAL EFFECTS OF MINIMUM AND MAXIMUM TEMPERATURE INCREASE ON GRAPEVINE IN EXTREMADURA (SPAIN)

Virginia ALBERDI, Francisco J. MORAL, Francisco J. REBOLLO, Luis L. PANIAGUA, Abelardo GARCÍA-MARTÍN, Cristina AGUIRADO 559

EFFECT OF NITROGEN FERTILIZATION ON TRITICALE GROWN FOR DUAL PURPOSE OF FORAGE PLUS GRAIN IN SEMI-ARID ENVIRONMENT

Sadreddine BEJI.....	560
POTENTIAL AND POSSIBILITY OF CONVERTING AGRICULTURAL WASTES TO BENEFICIALLY SUSTAINABLE ENERGY AND MANURE IN TURKEY	
Ako OMER	561
THE RELATIONSHIP OF GLOBAL CLIMATE CHANGE WITH AGRICULTURE AND ENVIRONMENT	
Aybüke KAYA	562
DETERMINATION OF ENTERIC METHANE EMISSIONS AMOUNT FROM SHEEP BREEDING BETWEEN 2004-2020 IN TURKEY	
Busra YAYLI, Ilker KILIC.....	563
ASH CONTENT OF SOME OAK SPECIES	
Gülnür MERTOĞLU ELMAS, Beyza KARABULUT	564
THE QUALITY PARAMETERS OF RECYCLED PAPER	
Gülnür MERTOĞLU ELMAS, Beyza KARABULUT	565
FIBER PROPERTIES OF <i>RUMEX CRISPUS</i> L. ROOT	
Gülnür MERTOĞLU ELMAS.....	566
INVESTIGATION OF LANDSCAPE CHARACTERISTICS OF DÜZCE PROVINCE, AKÇAKOCA DISTRICT IN THE SCOPE OF ECOTOURISM AND DEVELOPMENT OF ECOTOURISM RESOURCES	
Gümüş Funda GÖKÇE, Mustafa ÖZBAY, Sinisa BERJAN.....	567
DENSITY AND HABITAT PREFERENCE OF AN INVASIVE SPECIES (<i>Diadema setosum</i>, Leske, 1778) IN THE MEDITERRANEAN SEA	
Mustafa Remzi GÜL, Mehmet AYDIN.....	568
ASSESSMENT OF WATER AND ECONOMIC PRODUCTIVITY IN IRRIGATION MANAGEMENT	
Oner CETIN, Kivanc Hayri DOGANAY, Ali Fuat TARI.....	569
UNDERSTANDING THE RELATIONSHIP AMONG GEOMORPHOMETRY, SPECTRAL INDICES, AND SOME SOIL PROPERTIES IN A WATERSHED SCALE	
Turgay DINDAROGLU, Vesna TUNGUZ, Emre BABUR, Mahmoud SELEIMAN , Rana ROY, Elina ZAKHARCHENKO	570
SEED-ENHANCEMENT TECHNOLOGIES FOR ENHANCING SUSTAINABLE RESTORING OF THE ARID-LANDS	
Heba JARRAR, Ali El-KEBLAWY	571
IMPACT OF AGRICULTURAL RUNOFF OF PHOSPHORUS IN COASTAL WATER QUALITY	
Deb JAISI, Qiang LI, Jessica ANTON, Kristi MINGUS	572

5. ANIMAL HUSBANDRY573

NUTRITIONAL VALUE OF GRASSLAND MEADOW GRASS GRAZED BY DAIRY COWS
Malika ABBAD-BENNOUR, Messaouda BELAID, Rachid AMRANE, Melkhir BOUDI, Fares
BAICHE, Kenza KHELIL 574

**FARM CHICKEN ISA F15 STRAIN MONITORING IN THE TABLAT REGION (WILAYA
DE MEDEA) ALGERIA**
Abdelkrim YAHIMI, Nadia DJELLATA, Khadidja SELLALI 575

**THE HEALTH STATUS OF FOOT AND UDDER AT THE LEVEL OF DAIRY FARMS IN
THE COMMUNE OF SIDI MHAMED BENALI**
Nassima BOUHROUM, EL-Hassen LANKRI, Belmehel BENS AHLI..... 576

**FACTORS AFFECTING BIRTH WEIGHT OF ALGERIAN ARABIA GOATS KIDS
REARED UNDER EXTENSIVE PRODUCTION SYSTEM**
Allaoua BOUMEZAOUET, Rabeh ZEB SA, Saida MATALLAH, Lamia MEBIROUK-
BOUDECHICHE, Kahina HOUD-CHAKER 577

**ISOLATION AND ANTIBIOTIC RESISTANCE OF *SALMONELLA* IN ALGERIAN
BROILER SECTOR**
Hamza KHALED, L. F. BENAMARA, N. KEBBAB 578

**ISOLATION AND ANTIBIOTIC RESISTANCE OF *SALMONELLA* IN ALGERIAN
BROILER SECTOR**
Hamza KHALED, Lynda Fatma BENAMARA, Nassima KEBBAB 579

**DAILY BEHAVIOR OF LOCAL BREED CATTLE AT THE AULNAIE OF AIN KHIAR
DURING THE SUMMER**
Razika BOURAS, Kahina HOUD-CHAKER, Lamia BOUDECHICHE 580

**NUTRITIONAL VALUE OF GRASSLAND MEADOW GRASS GRAZED BY DAIRY COWS
BY USING PRIVALIM SOFTWARE**
Malika ABBAD-BENNOUR, Messaouda BELAID, Samir AIT SAID, Rachid AMRANE, Melkhir
BOUDI, Fares BAICHE, Kenza KHELIL 581

**BACTERIAL ECTOMICROFLORA OF *VARROA DESTRUCTOR*, ECTOPARASITE OF
HONEYBEE, COLLECTED IN THE APIARY OF BOUMERDES (ALGERIA)**
Messaouda BELAID, Nora CHAHBAR, Fatma ACHEUK, Abdelkader OUIDAH, Mohamed
Oussama AOMICHE 582

**EFFECT OF *VARROA DESTRUCTOR* ON THE HIND WINGS AND ON THE
PHYSIOLOGY OF THE WORKER HONEYBEE (*APIS MELLIFERA INTERMISSA*)**
Messaouda BELAID, Nora CHAHBAR, Fatma ACHEUK, Malika BENNOUR, Salaheddine
DOUMANDJI..... 583

STUDY OF THE ANTIBIOTICS AND SYMBIOTIC EFFECTS ON SPERMATIC QUALITY BY THE CASA SYSTEM	
Mohamed El Bachir BOUCHICHA , Ammar KALEM, Nora MIMOUNE , Djamel KHELEF , Rachid KAIDI	584
REPRODUCTIVE PARAMETERS IN A DAIRY FARM IN THE CENTER REGION OF ALGERIA	
Ahmed El Bachir BOUCHICHA , Nora MIMOUNE , Mohamed Yassine AZZOUZ , Djamel KHELEF , Rachid KAIDI	585
FELINE LEISHMANIASIS IN ALGERIA	
Mustapha DJOUDI, R. TRIKI YAMMANI, R. KAIDI	586
PREVALENCE OF THE MAIN REASONS FOR SEIZING CARCASSES AND BOVINE VISCERS IN SLAUGHTERHOUSES IN NORTHERN ALGERIA	
Nadia DJELLATA , Aicha DAOUDI, Kenza MEDJAHED, Sarah NOURI	587
STUDY OF CERTAIN ZOOTECHNICAL PARAMETERS DURING MONITORING OF CHICKEN BREEDING IN ALGERIA	
Nadia DJELLATA, Saliha BOUCHAREB.....	588
PREVALENCE AND RISK FACTORS OF CRYPTOSPORIDIOSIS IN CALVES IN NORTHERN ALGERIA	
Nadia OUAKLI, Nadia DJELLATA, Abdelkrim YAHIMI, Rachid KAIDI.....	589
STUDY OF ANOGENITAL DISTANCE IN RABBITS: EFFECT ON SEXUAL BEHAVIOUR AND LITTER SIZE BIOLOGIC COMPONENTS	
Naouel FEKNOUS, Rafik BELABBAS, Safia ZENIA, Ali BERBAR.....	590
SEROPREVALENCE OF BORDER DISEASE VIRUS AND OTHER PESTIVIRUSES IN SHEEP IN ALGERIA AND ASSOCIATED RISK FACTORS	
Naouel FEKNOUS, Hamza KHALED, Abdellah BOUYOUCHEF	591
CONTRIBUTION TO THE ASSESSMENT OF THE PHYSICOCHEMICAL, MICROBIOLOGICAL AND PARASITOLOGICAL QUALITY OF WATER FOR LIVESTOCK IN THE CENTRAL ALGER REGION	
Rafik BELABBAS, Ali BERBAR, Rym EZZEROUG	592
CHARACTERIZATION OF SEMEN OF THREE RABBIT BREEDS AND ARTIFICIAL INSEMINATION	
Rafik BELABBAS, Ali BERBAR, Rym EZZEROUG	593
GENETIC CORRELATIONS FOR REPRODUCTIVE AND GROWTH TRAITS IN RABBITS	
Rafik BELABBAS, Rym EZZEROUG, Maria José ARGENTE, Ali BERBAR, Samir DISS, Zoulikha BOUDJELLA, Djamel TALAZIZA, Nassima BOUDAHDIR, Ghania ZITOUNI, Maria de La Luz GARCIA	594

EVALUATION OF DIGESTIVE DISORDERS DUE TO <i>ESCHERICHIA COLI</i> IN RABBIT FARMS IN ALGERIA	
Rym EZZEROUG, Naouel FEKNOUS, Abdellah BOUYOUCHEF	595
PERINATAL FACTORS AFFECTING SURVIVAL OF KITS	
Rym EZZEROUG, Maria De La Luz GARCIA, Rafik BELABBAS, Ali BERBAR, Maria José ARGENTE	596
PREVALENCE OF COCCIDIAN INFECTION IN RABBIT FARMS IN NORTH ALGERIA	
Samia MAZIZ-BETTAHAR, Miriem AISSI, Hacina AINBAZIZ, Mohamed Sadek BACHENE, Safia ZENIA, Fairouz GHISANI	597
IMPACT OF COCCIDIAL INFECTION ON THE ZOOTECHNICAL PERFORMANCE OF THE LOCAL RABBITS POPULATION	
Samia MAZIZ-BETTAHAR, Miriem AISSI, Hacina AINBAZIZ, Safia ZENIA, Dalila TARZAALI, Ibtissem BOULBINA.....	598
EFFECT OF INCORPORATION OF THE PLANT EXTRACTS IN NATURAL CASING ON CONTENT OF FATTY ACIDS IN FERMENTED SAUSAGES	
Ana VELEMIR, Snježana MANDIĆ, Danica SAVANOVIĆ	599
EFFECT OF THAWING METHODS ON THE PHYSICO-CHEMICAL PROPERTIES OF TURKEY MEAT	
Danica SAVANOVIĆ, Snježana MANDIĆ, Goran VUČIĆ, Ana VELEMIR, Jovo SAVANOVIĆ, Nemanja TEŠANOVIĆ.....	600
SENSORY PROPERTIES OF CHEESES OBTAINED BY DIFFERENT PROCESSES HEAT-ACID COAGULATION OF MILK	
Danica SAVANOVIĆ, Ana VELEMIR, Jovo SAVANOVIĆ, Nevena RITAN	601
NUTRITIONAL VALUE OF TRAPPIST CHEESE	
Draženko BUDIMIR.....	602
A CONTROL SYSTEM FOR REMOTE MONITORING AND CONTROL OF THE TEMPERATURE IN CHICKEN EGGS HATCHING USING ARTIFICIAL INCUBATORS	
Nataša POPOVIĆ, Božidar POPOVIĆ	603
INFLUENCE OF THE AGE OF LAYING HENS ON EGG PRODUCTION INTENSITY OF DIFFERENT EGG WEIGHT GROUPS	
Tatjana KRAJISNIK, Jelena NIKITOVIC, Miroslav LALOVIC , Zoran MALETIC.....	604
INFLUENCE OF LOCATION ON PARAMETERS OF CORN SILAGE QUALITY PREPARED ON FAMILY FARMS	
Željko LAKIĆ, Rada JOVIĆEVIĆ, Bojana SAVIĆ, Igor ĐURDIĆ	605
TECHNICAL EFFICIENCY OF THE RIPARIAN BEEKEEPERS OF THE COMPLEX OF PROTECTED AREAS PÔ-NAZINGA-SISSILI IN BURKINA FASO	
Soumaïla SAWADOGO ; Omer Souglimpo COMBARY; Alexis KABORE; Fabio BERTI	606

VALIDATION OF A SCREENING METHOD FOR THE DETECTION OF RESIDUES OF SIX FAMILIES OF ANTIBIOTICS IN BROILER CHICKEN DROPPINGS Camila BRAVO, Patricia DÍAZ, Diego ASTUDILLO, Ekaterina POKRANT, Aldo MADDALENO, Javiera CORNEJO	607
EFFECT OF THE EXTRACTION PROCESS OVER THE OXYGEN RADICAL ABSORBANCE CAPACITY (ORAC) AND POLYPHENOL PROFILES OF GRAPE MARC Jurij WACYK, Rodrigo MANCILLA, Jessica DORNER, Ivonne Lozano ÁLVARO PEÑA.....	608
ACARICIDAL EFFECT OF ESSENTIAL OILS ACTIVE SUBSTANCES AND ACTIVE SUBSTANCES OF ACARICIDES AGAINST THE POULTRY RED MITES Iva RÁDSETOULALOVÁ, Lucie KUPČÍKOVÁ, Martina LICHOVNÍKOVÁ	609
EFFECT OF PRE-INCUBATION ON EMBRYONIC DEVELOPMENT AND HATCHABILITY Marketa SKOUPA, Martina PESANOVA TESAROVA, Martina LICHOVNIKOVA, Marian FOLTYN.....	610
EFFECT OF GENDER ON BASIC MEAT PRODUCTION PARAMETERS IN LAMB CARCASSES Jan KUČHTÍK, Leona KONEČNÁ, Monika ŠELIGOVÁ, Tomáš KOPEC, Radek FILIPČÍK	611
THE INFLUENCE OF AGE ON QUALITATIVE AND QUANTITATIVE PARAMETERS OF STALLION EJACULATE Vojtěch PEŠAN, Katarína SOUŠKOVÁ, Radek FILIPČÍK, Zuzana REČKOVÁ, Martin HOŠEK, Michaela BRUDŇÁKOVÁ	612
THE PRODUCTIVE PERFORMANCE AND BLOOD ATTRIBUTES OF MAGHRABIAN DROMEDARY CAMEL INFLUENCED BY DIFFERENT BREEDING SYSTEMS Fatma R. ABDEL AZIZ, Talal A. ABDULKAREEM	613
EFFECT OF WATER SALINITY ON GROWTH PERFORMANCE, SURVIVAL RATE, FEED UTILIZATION AND BODY CHEMICAL COMPOSITION OF PACIFIC WHITE SHRIMP (<i>LITOPENAEUS VANNAMEI</i> BOONE, 1931) JUVENILE Shimaa SERAG, Ramadan M. ABOU-ZIED, Mohamed FATHI	614
THE DIFFERENTIATION OF BEEKEEPING PRACTICES SUCH AS WITNESSES TO THE EVOLUTION OF THE RELATIONSHIP BETWEEN BEEKEEPING AND AGRICULTURE WITHIN THE TERRITORY AND SYSTEMS OF ACTIVITIES Ludovic ANDRES, Michel VAILLANT, Anna CASSOU.....	615
EFFECTS OF PHYTOGENIC POLYPHENOLS IN FEED - A REVIEW Bettina FAEHNRICH	616
SUSTAINABLE BREEDING STRATEGIES FOR CLIMATE CHANGE ADAPTATION FOR THE HONEYBEE Kaspar BIENEFELD.....	617

TERATOGENICITY TESTING OF CHLORPYRIFOS AND TEBUCONAZOLE IN CHICKEN EMBRYOS AFTER SIMULTANEOUS ADMINISTRATION	
Rita SZABÓ, László MAJOR, József LEHEL, Nadhirah Binti SAIDON, Péter BUDAI.....	618
CYTOLOGICAL EVALUATION OF MILK IN BOVINE MASTITIS: A PILOT RESEARCH	
Janka TURBÓK, Gábor TORNÝOS, Zoltán ZOMBORSZKY.....	619
POST THAW QUALITY AND VIABILITY OF VITRIFIED IMMATURE OOCYTES USING DIFFERENT CRYOPROTECTANT CONCENTRATIONS IN SHEEP	
Khursheed AHMAD SOFI, Beenish QURESHI, Riaz AHMAD SHAH, Mujeebur REHMAN FAZILI.....	620
POST THAW IN VITRO MATURATION OF VITRIFIED IMMATURE OOCYTES IN SHEEP USING DIFFERENT CRYOPROTECTANT CONCENTRATIONS	
Khursheed AHMAD SOFI, Beenish QURESHI, Tanveer MUSHTAQ.....	621
GROWTH PERFORMANCE AND KLEIBER RATIO OF MECHERI SHEEP UNDER SMALL HOLDER MANAGEMENT SYSTEM OF TAMIL NADU	
Muralidharan JAGANATHAN, Bandeswaran CHINNAONDI, Arun LOGANATHAN, Sankar VENKATACHALAM, Senthilkumar PANEERSELVAM, Thiruvankadan ARANGANNOOR KANNAN, Rajendran RAMANUJAM.....	622
EFFECT OF OLIVE LEAVES FEEDING ON PHENOLIC COMPOSITION AND PROTEASE ACTIVITY IN GOAT MILK	
Andrea IANNI, Francesca BENNATO, Camillo MARTINO, Lisa GROTTA, Giuseppe MARTINO.....	623
SILAGE PRODUCTION FOR RUMINANTS USING AGRO-INDUSTRIAL BYPRODUCTS	
Angela Gabriella D'ALESSANDRO, Francesco VIZZARRI, Francesco IANNACCONE, Giovanni MARTEMUCCI.....	624
CHARACTERIZATION OF THE RUMEN MICROBIOTA IN SAANEN GOAT KIDS FED OLIVE LEAVES	
Francesca BENNATO, Andrea IANNI, Camillo MARTINO, Lisa GROTTA, Giuseppe MARTINO.....	625
BALANCED FEEDING AFFECTS THE MINERAL CONTENT OF AWASSI SHEEP MILK	
Muhi El-Dine HILALI, Barbara RISCHKOWSKY, Helmut MAYER.....	626
BEE COLONY SWARMING EVENT DETECTION IN PRECISION BEEKEEPING	
Aleksejs ZACEPINS, Armands KVIESIS, Vitalijs KOMASILOVS.....	627
INFLUENCE OF BREED AND SEASON ON GOAT MILK AMINO ACIDS AND FATTY ACIDS	
Evaldas ŠLYŽIUS, Vida JUOZAITIENĖ, Lina LAUČIENĖ, Rolandas STANKEVIČIUS, Lina ANSKIENĖ, Birutė ŠLYŽIENĖ.....	628

FERMENTATION AND MICROBIAL DYNAMICS OF PERENNIAL GRASSES SILAGE PREPARED WITH BIOLOGICAL INOCULANT

Jurgita DAILIDAVIČIENĖ, Lina MERKEVIČIENĖ, Modestas RUŽAUSKAS, Sigita KERZIENĖ, Saulius ALIJOŠIUS 629

EVALUATION OF MILK YIELD AND MILKING CHARACTERISTICS OF DIFFERENT GENOTYPES DURING LACTATION IN ORGANIC FARMS

Lina ANSKIENĖ, Renata JAPERTIENĖ, Giedrius PALUBINSKAS, Sigitas JAPERTAS..... 630

PRODUCTIVITY DYNAMICS AND RELATIONSHIP BETWEEN QUANTITATIVE AND QUALITATIVE INDICATORS IN COWS OF THE HOLSTEIN BREED

Valentin FOKSHA, Alexandra KONSTANDOGLO, Vera GRANATCH, Igor AKBASH, Vasily KURULYUK 631

ALTERNATIVE CELLS FOR ISOLATION, DETECTION AND PROPAGATION OF CAPRIPOX VIRUSES

Halima RHAZI, Najete SAFINI, Karima MIKOU, Meryeme ALHYANE, Matthias LENK, Khalid OMARI TADLAOUI, Mehdi ELHARRAK..... 632

THE PREVALENCE OF SELECTED GENES AND MULTIDRUG RESISTANCE IN *CAMPYLOBACTER* SPP. ISOLATED FROM DOGS

Marek SELWET 633

RESEARCH ON THE MANAGEMENT OF DAIRY BREEDING IN A FARM IN THE DORNELOR BASIN IN ROMANIA

Maria CIOCAN-ALUPII, Vasile MACIUC 634

STUDY OF MILK PRODUCTION INDICES IN MARAMUREȘ BROWN BREED EXPLOITED AT THE SECUIENI NEAMȚ AGRICULTURAL RESEARCH AND DEVELOPMENT STATION

Mariana NISTOR-ANTON, Vasile MACIUC..... 635

STUDIES ON ABERDEEN ANGUS BREEDING SYSTEMS AND LIVESTOCK IN ROMANIA

Mihaela ROIBU DABIJA, Mihai Cezar CIORAN, Vasile MACIUC 636

INFLUENCE OF BACTERIA BACILLUS AND INACTIVATED YEASTS ON PHYSIOLOGICAL PARAMETERS AND HONEY PRODUCTIVITY OF BEES

Elina SOKOLOVA, Sergei MAGER, Ekaterina GRIZANOVA, Ivan DUBOVSKY..... 637

GENETIC IMPROVEMENT OF PRODUCTION AND REPRODUCTION TRAITS OF PIGS

Lyubov GETMANTSEVA, Neckruz BAKOEV 638

THE RELATIONSHIP BETWEEN CATTLE METABOLISM AND QUALITY OF FEED RATION

Nikolai A. MOROZKOV, Elena V. SUHANOVA 639

STUDY OF THE DYNAMICS OF BETA-HYDROXYBUTYRATE AND HEPATO-SPECIFIC MARKERS IN THE BLOOD OF NEWLY CALVED COWS WITH DIFFERENT BODY CONDITION

Svetlana V. VASILEVA, Roman M. VASILEV 640

THE PHYTOBIOTIC EFFECT OF NETTLE (*Urtica Simensis S.*) ON THE GROWTH OF CHICKEN “COBB 500”

Bratislav PEŠIĆ, Nikola STOLIĆ, Nebojša ZLATKOVIĆ 641

COW MILK INSULIN LIKE GROWTH FACTOR-1: RISK OR BENEFIT FOR HUMAN HEALTH?

Danijela KIROVSKI, Dragan KNEŽEVIĆ, Bojan GOLIC, Dragan KASAGIĆ, Ljubomir JOVANOVIĆ, Dušan BOŠNJAKOVIĆ, Julijana TRIFKOVIĆ, Željko SLADOJEVIĆ 642

THE HONEY AND ENVIRONMENT

Diana BILIĆ-ŠOBOT, Aleksandar ŠOBOT 643

CORRELATIONS BETWEEN THE QUANTITY OF FORAGED POLLEN, THE NUMBER OF FORAGERS AND THE MORPHOLOGICAL TRAITS OF THE HONEY BEES

Goran JEVTIĆ, Bojan ANĐELKOVIĆ, Snežana ANĐELKOVIĆ, Vladimir ZORNIĆ, Kazimir MATOVIĆ, Nebojša NEDIĆ 644

A NEED FOR THE INTRODUCTION OF THE PIG CARCASS CLASSIFICATION SYSTEM IN THE REPUBLIC OF SERBIA

Ivan RADOVIĆ, Miroslava POLOVINSKI-HORVATOVIĆ, Mile MIRKOV, Nenad KATANIĆ 645

QUALITY OF TABLE EGGS OF WHITE AND BROWN SHELL

Lidija PERIĆ, Mirjana ĐUKIĆ STOJČIĆ, Sava SPIRIDONOVIĆ 646

INFLUENCE OF REARING SYSTEM ON THE CARCASS TRAITS AND CARCASS CONFORMATION OF FATTENING CHICKENS

Lidija PERIĆ, Mirjana ĐUKIĆ STOJČIĆ, Sava SPIRIDONOVIĆ 647

THE IMPACT OF ORGANIC PRODUCTION OF GEESE ON THE ENVIRONMENT THROUGH THE PRISM OF EU LEGISLATION

Milena MILOJEVIĆ, Goran STANIŠIĆ, Aleksandra MILOŠEVIĆ, Tatjana KRAJIŠNIK 648

EFFECTIVE POPULATION SIZE AND INBREEDING RATE OF HOLSTEIN POPULATION IN VOJVODINA AUTONOMOUS PROVINCE (SERBIA)

Mirko IVKOVIĆ, Momčilo ŠARAN, Vladimir SAPUNDŽIĆ, Ljuba ŠTRBAC, Snežana TRIVUNOVIĆ 649

THE HEAVY METALS IN THE LIVER OF FATTENING PIGS AND MANGULICA IN THE REGION OF VOJVODINA, SERBIA

Miroslava POLOVINSKI-HORVATOVIĆ, Ivan RADOVIĆ, Saša KRSTOVIĆ, Igor JAJIĆ, Darko GULJAŠ, Mile MIRKOV 650

DEFINING THE ECONOMIC VALUE OF THE TRAITS INCLUDED IN THE METHODS FOR THE ASSESSMENT OF PIGS GENETIC POTENTIAL	
Mladen POPOVAC, Dragan RADOJKOVIĆ, Milica PETROVIĆ, Radomir SAVIĆ, Aleksandar MILETIĆ, Dalibor VUKOJEVIĆ, Radmila BESKOROVAJNI	651
THE EFFECT OF ADDITIONAL FEEDING ON PRODUCTION TRAITS OF HONEYBEE COLONIES	
Nebojša NEDIĆ, Denis VOJT, Kazimir MATOVIĆ, Goran JEVTIĆ	652
THE EFFICIENCY OF USE OF OXALIC ACID AND THYMOL IN BEE COLONIES AGAINST <i>VARROA DESTRUCTOR</i> DURING AN ACTIVE SEASON	
Nebojša NEDIĆ, Denis VOJT, Kazimir MATOVIĆ, Goran JEVTIĆ	653
THE INFLUENCE OF FORAGE AND CONCETRATE RATIO IN THE DIET ON ESSENTIAL FATTY ACID CONTENT IN COWS MILK FAT	
Nenad ĐORĐEVIĆ, Dušica RADONJIĆ, Goran GRUBIĆ, Bojan STOJANOVIĆ, Aleksa BOŽIČKOVIĆ, Blagoje STOJKOVIĆ	654
DETERMINATION OF EXTERNAL, INTERNAL AND PROPERTIES OF EGGSHELL QUALITY	
Ranko KOPRIVICA, Simeon RAKONJAC, Biljana VELJKOVIĆ, Dušan RADIVOJEVIĆ, Milun D. PETROVIĆ, Miloš Ž. PETROVIĆ, Jelena MLADENOVIĆ	655
EFFECT OF SELENIUM FROM FOOD ON PHEASANT MEAT QUALITY	
Saša OBRADOVIĆ, Raško STEFANOVIĆ, Sinisa BERJAN	656
QUALITY AND SENSORY PROPERTIES OF WHITE-BRINED GOAT CHEESE	
Snežana JOVANOVIĆ, Tanja VUČIĆ, Amarela TERZIĆ-VIDOJEVIĆ, Milica SPASENOVIĆ, Daliborka VUJČIĆ	657
SPOILAGE POTENTIAL OF PASTEURIZED MILK MICROBIOTA	
Tijana LEDINA, Jasna ĐORĐEVIĆ, Petar KRIVOKUĆA, Sara KITANOVIĆ, Snežana BULAJIĆ	658
THE OCCURRENCE OF SUBCLINICAL MASTITIS AT SELECTED FARMS	
Kristína TVAROŽKOVÁ, Vladimír TANČIN, Michal UHRINČAŤ, Lucia MAČUHOVÁ, Lukáš HLEBA	659
ANTIMICROBIAL EFFECT OF COMMERCIAL POMEGRANATE POWDER ON BULL SEMEN MICROBIOTA	
Aleksandar COJKIC, Ingrid HANSSON, Jane M. MORRELL	660
CURRENT SITUATION OF ANATOLIAN BUFFALO HUSBANDRY AND BREEDING POSSIBILITIES IN VAN PROVINCE OF TURKEY	
Turgut AYGÜN	661
OCCUPATIONAL HEALTH AND SAFETY CULTURE IN ANIMAL PRODUCTION IN TURKEY	

Turgut AYGÜN	662
NOMADIC ACTIVITIES OF SMALL RUMINANT HUSBANDRY IN MUŞ PROVINCE OF EASTERN ANATOLIA IN TURKEY	
Turgut AYGÜN	663
COMPARISON OF EGGS FROM DIFFERENT EGG PRODUCTION SYSTEMS IN TERMS OF CAMPYLOBACTER	
Ali AYGÜN, Talha DEMİRCİ, Doğan NARİNÇ	664
MODELING OF GROWTH IN JAPANESE QUAILS CATEGORIZED BY EGG WEIGHT	
Ali AYGÜN, Doğan NARİNÇ	665
THE EFFECT OF DIFFERENT PLANT VEGETATION IN FREE-RANGE SYSTEM ON EGG SHELL MICROBIAL LOAD	
Ali AYGÜN, Talha DEMİRCİ, Doğan NARİNÇ	666
THE IMPACT OF BREEDING SEASON AND EGG STORAGE PERIOD ON HATCHERY PARAMETERS OF GRAND PARENT STOCK BROILER BREEDER EGGS	
Bilgehan YILMAZ DİKMEN.....	667
USING PROBIOTICS IN POULTRY NUTRITION: OPTIMIZING PERFORMANCE AND FEEDING COSTS	
Merve GÜNDÜZ, Serap FENDERYA, Arda SÖZCÜ	668
AVIAN HERPESVIRUSES AND THEIR POTENTIAL IMPACTS ON POULTRY HEALTH	
Mustafa SOGUT, Bilge Kaan TEKELIOGLU	669
IMPLICATIONS OF YUCCA IN REDUCING NITROGEN EXCRETION, OXIDATIVE STRESS AND IMPROVING PRODUCTION PERFORMANCE OF BROILER BIRDS	
Asad SULTAN, Sar ZAMIN KHAN, Ziaul ISLAM, Faiza SHAHZADI.....	670
6. RURAL DEVELOPMENT AND AGROECONOMY.....	671
ANALYZE OF FACTORS AFFECTING MARKETING CHANNEL CHOICE OF SMALLHOLDER FARMERS IN AFGHANISTAN	
Ahmad Khalid SALAH, Hideyuki KANO, Naoyuki YAMAMOTO.....	672
DIFFUSION OF SAVING IRRIGATION TECHNOLOGIES: THE ROLE OF PUBLIC INCENTIVES AND CROP PRICES	
Samir BELAIDI, Foued CHEHAT	673
LOCAL HONEY GOAT MILK YOGHURT PRODUCTION. PROCESS AND QUALITY CONTROL	
Nesrine FEKNOUS , Lina Lamis OUCHENE , Mahieddine BOUMENDJEL , Djamel-Eddine MEKHANCHA , Yasmine BOUDIDA , Ahmed CHETTOUM , Amel BOUMENDJEL , Mahfoud MESSARAH	674

PHYSICOCHEMICAL AND GLUCIDS PROFILE OF MOUNTAIN HONEYS FROM SERAIDILOCALITY (NORD-EAST, ALGERIA)	
Nesrine FEKNOUS, Mahieddine BOUMENDJEL, Ahmed CHETTOUM, Djamel-Eddine MEKHANCHA, Azzeddine CHEFROUR, Abdelmoumen SEDARI, Anissa BERREDJEM, Hanène ATI, Faiza TAIBI, Amel BOUMENDJEL, Mahfoud MESSARAH	675
MONITORING THE CONDITION OF AGRICULTURAL LAND AS A TOOL OF THE PRECISION FARMING SYSTEM	
Anna KAZAK	676
EXPLORING MOROCCAN OLIVE OIL CONSUMER ATTITUDE USING CONJOINT ANALYSIS	
Kaoutar JAMAI, Ali ABIDAR	677
TRACTOR SELECTION BY USING THE <i>FUZZY</i> TOPSIS METHOD OF MULTI-CRITERIA DECISION-MAKING	
Miroslav NEDELJKOVIĆ	678
RESILIENCE TO CLIMATIC INSTABILITIES IN BRAZILIAN SEMIARID RAINFED AGRICULTURE	
José de Jesus Sousa LEMOS.....	679
THE BULGARIAN MODEL OF LAND OWNERSHIP: THE "WHITE SPOTS" PHENOMENON	
Diana KOPEVA, Angel SAROV.....	680
RURAL DEVELOPMENT IN BULGARIA – SOME ECONOMIC AND DEMOGRAPHIC ASPECTS	
Kliment NAYDENOV, Metodi IVANOV, Nadezhda ZHECHKOVA, Dimitar ATANASOV.....	681
TRANSITION TOWARDS BLUE ECONOMY IN THE EUROPEAN UNION	
Monika SABEVA	682
THE INFLUENCING FACTORS OF DAIRY FARMERS' DECISION MAKING FOR MANURE AND SEWAGE MANAGEMENT: A CASE STUDY IN CHINA	
Junyan ZHANG, Lei ZHANG, Mengmeng WANG, Changbin YIN, Thomas DOGOT	683
CHANGES IN GROCERY PURCHASES IN THE NEW MILLENNIUM: THE EXAMPLE OF THE SOUTH MORAVIAN REGION IN THE CZECH REPUBLIC	
Zdenek SILHAN, Ondrej KONECNY.....	684
INVOLVEMENT OF FARMERS IN LOCAL PARTNERSHIPS: STUDY OF LOCAL ACTION GROUPS STRUCTURE IN THE CZECH REPUBLIC	
Ondřej KONEČNÝ, Pavla SADLOŇOVÁ, Zdeněk ŠILHAN, Marie JÍLKOVÁ.....	685
TRADE EXCHANGE AND THE POSSIBILITY OF ACHIEVING FOOD SECURITY BETWEEN EGYPT AND NILE BASIN COUNTRIES	
Mahmoud ABDELSALM AHMED	686

CHARACTERIZATION OF COLUMBIAN COCOA BUTTER: INFLUENCE OF COMPOSITION ON STRUCTURE	
Daniel J. E. KALNIN.....	687
THE TWO DISCREET PILLARS OF FOOD SECURITY: TRUST AND INFORMATION SHARING	
David GASC, Elen LEMAITRE-CURRI	688
THE MED-AMIN HARVEST EARLY FORECAST AS A CONTRIBUTION TO FOOD SECURITY IN THE MEDITERRANEAN	
David GASC, Giacinto MANFRON, Pascal BERGERET, Bettina BARUTH.....	689
STUDY OF THE TRAJECTORIES OF CHANGES IN BEEKEEPING IN A SMALL REGION OF IN BOSNIA AND HERZEGOVINA	
Vesna MRDALJ, Ludovic ANDRES, Michel VAILLANT, Etienne ESTNER.....	690
BETWEEN ENVIRONMENT AND SOCIETY: IS THE KITOB-SHAHRISABZ AGRARIAN SYSTEM ABLE TO COPE WITH POPULATION GROWTH IN A CONTEXT OF UNEQUAL ACCESS TO RESOURCES?	
Ludovic ANDRES, Michel VAILLANT, Anna MORIO	691
LEADING FACTORS OF SUSTAINABLE RURAL TOURISM DEVELOPMENT: CASE OF GEORGIA	
Maia DIAKONIDZE.....	692
DOING IT RIGHT TO ALLEVIATE POVERTY: APPLICATION OF THE SUSTAINABLE FOOD VALUE CHAIN DEVELOPMENT FRAMEWORK TO GHANA’S POULTRY SECTOR	
Mavis BOIMAH, Craig CHIBANDA, Johanna SCHOTT	693
BIOECONOMY IN LIVESTOCK SECTOR THROUGH BIBLIOMETRIC NETWORK ANALYSIS: A CASE FROM GREECE	
Aikaterini PALTAKI, Konstantinos ZARALIS, Fotios CHATZITHEODORIDIS, Anastasios MICHAILIDIS, Efstratios LOIZOU	694
CURRENT SITUATION AND TRAINING NEEDS ON HERB SECTOR: EVIDENCE FROM GREECE, MOLDOVA, ARMENIA AND GEORGIA	
Aikaterini PALTAKI, Evropi-Sofia DALAMPIRA, Anastasios LIVADIOTIS, Smaragda NIKOULI, Anastasios MICHAILIDIS, Sona TELUNTS, Tamar SARGSYAN, Oxana PALADICIUC, Roman CURCA, Natia GELASHVILI.....	695
A BIBLIOMETRIC NETWORK ANALYSIS ON AGRICULTURAL BIOECONOMY	
Christina-Ioanna PAPADOPOULOU, Katerina MELFOU, Efstratios LOIZOU, Christos KARELAKIS	696
THE POLICY REFORMS THAT SHAPED CONTEMPORARY RURAL SOCIETY IN GREECE	

Georgia KIPOUROPOULOU, Katerina MELFOU	697
EFFECTIVENESS OF VILLAGE LEVEL ORGANIZATION (VLO) UNDER NATIONAL RURAL LIVELIHOOD MISSION, NAGALAND, INDIA.	
Mary N ODYUO, J. LONGKUMER, Renjano N. OKHYOPVUI.....	698
AGRICULTURE EXTENSION AND ADVISORY SERVICES IN BURKINA FASO AND NIGER	
Hamid EL BILALI, Lawali DAMBO, Imaël Henri Nestor BASSOLE, Jacques NANEMA.....	699
TRANSITION TO ORGANIC AGRICULTURE IN MOROCCO	
Hamza EL GHMARI, Rachid HARBOUZE, Hamid EL BILALI.....	700
AGROECOLOGY IN BURKINA FASO AND NIGER	
Hamid EL BILALI, Lawali DAMBO, Imaël Henri Nestor BASSOLE, Jacques NANEMA, Generosa CALABRESE	701
URBAN AND PERI-URBAN AGRICULTURE IN EGYPT	
Islam Mohamed KAMEL, Hamid EL BILALI.....	702
MEDITERRANEAN DIET IN THE WESTERN BALKANS	
Hamid EL BILALI, Gianluigi CARDONE, Francesco BOTTALICO, Giovanni OTTOMANO PALMISANO, Antonia ACQUAFREDDA, Roberto CAPONE.....	703
PASTORALISM AND SUSTAINABLE DEVELOPMENT IN THE MEDITERRANEAN REGION	
Hamid EL BILALI, Francesco BOTTALICO, Giovanni OTTOMANO PALMISANO, Gianluigi CARDONE, Antonia ACQUAFREDDA, Roberto CAPONE.....	704
FOOD LOSSES AND WASTE DURING THE COVID-19 PANDEMIC AND HOW IT IS CHALLENGING AGRI-FOOD LOGISTICS	
Noureddin DRIOUECH, Erika QUENDLER.....	705
UNDERSTANDING THE ROLE OF THE CAP IN ACHIEVING SUSTAINABILITY AND RURAL DEVELOPMENT GOALS	
Valeria SODANO, Maria Teresa GORGITANO	706
SOCIAL-DEMOGRAPHIC CHARACTERISTICS OF THE HILLY-MOUNTAINOUS AREAS IN THE REPUBLIC OF NORTH MACEDONIA	
Jovan AZDERSKI, Bozhura FIDANSKA, Despina POPOVSKA STOJANOV, Elenica SOFIJANOVA , Elena AZDERSKA.....	707
ARGAN OIL COOPERATIVES IN THE SOUSS-MASSA REGION OF MOROCCO: A FORM OF COOPERATION LINKING PEOPLE TO THE LAND	
Fatiha ADDYOUBAH	708
QUALITY OF LIFE OF RURAL HOUSEHOLDS IN NIGERIA: AN ASSESSMENT OF SPICES PRODUCERS IN KANO STATE	

Oluyemisi ADEWALE, John OLADEJI, Yau MU'AZU, Muhammad SHUAIBU	709
SOCIO-ECONOMIC PROFILING OF SPICES ENTREPRENEURS IN OYO STATE, NIGERIA	
Oluyemisi ADEWALE, Timothy FARIYIKE, John OLADEJI	710
POTENTIALS OF IRRIGATION ALONG TELWA VALLEY IN TCHIROZERINE DEPARTMENT, AGADEZ AREA (NIGER)	
Ama Souleymane ABOUBACAR, Maharazu A. YUSUF, Mahamadou MOUSSA DIT KALAMOU, Soumana BOUBACAR.....	711
COUNTRY LEVEL ASSESSMENT OF FOOD LOSS AND WASTE IN PAKISTAN	
Junaid ALAM MEMON	712
MICROALGAE- ROLE IN DEVELOPMENT OF BIO (H₂, ETHANOL AND DIESEL) FUELS	
Sara JANIAD, Mehboob AHMED	713
YOUNG FARMERS IN PORTUGAL: ASSESSMENT OF POLICY EFFECTS	
Fátima OLIVEIRA, Pedro REIS , Ana Bela LOPES; M Leonor da Silva CARVALHO	714
FOOD WASTE MANAGEMENT ALONG THE AGRI-FOOD SUPPLY CHAIN	
Dimitrie STOICA, Angela-Eliza MICU, Petru ALEXE, Maricica STOICA	715
GREEN FOR CARE - STAKEHOLDER ANALYSIS IN ROMANIA	
Sergiu FLOREA, Sebastian CUCUIAT, Vladut TOMSA	716
ACCESS TO PUBLIC HEALTH SERVICES FOR DIFFERENT GROUPS OF RURAL POPULATION IN RUSSIA	
Tatiana BLINOVA, Anna VYALSHINA, Nikita PETROV	717
INCREASING THE AGRICULTURAL PRODUCT COMPETITIVENESS AS A FACTOR IN THE AGRICULTURAL ENTERPRISE EXPORT DEVELOPMENT	
Vyacheslav VOYTYUK, Tatiana MARINCHENKO, Margarita VOYTYUK.....	718
INTERNET OF THINGS IN LAND AND NATURAL RESOURCES MANAGEMENT	
Sergey VOLKOV, Dmitry SHAPOVALOV, Vasily NILIPOVSKIY.....	719
THE DETERMINANTS OF MICRO-AGRICULTURAL COMPANIES PROFITABILITY IN VOJVODINA PROVINCE (SERBIA)	
Dragana TEKIĆ, Beba MUTAVDŽIĆ, Dragan MILIĆ, Vladislav ZEKIĆ, Tihomir NOVAKOVIĆ, Veljko ŠARAC	720
STUDING UNIQUENESS OF ACACIA HONEY FROM SERBIA – EVALUATION OF SENSORY PROPERTIES, COLOR AND TEXTURE	
Dubravka ŠKROBOT, Jelena TOMIĆ, Nikola MARAVIĆ, Slađan RAŠIĆ, Aleksandra NOVAKOVIĆ, Aleksandar MARIĆ, Marijana SAKAČ	721

TENDENCIES AND PREDICTION OF PRICES OF INDUSTRIAL CROPS IN SERBIA Nebojša NOVKOVIĆ, Beba MUTAVDŽIĆ, Ljiljana DRINIĆ, Snežana JOVANOVIĆ, Dragana TEKIĆ	722
TENDENCIES AND PREDICTION OF GRAPE PRODUCTION CHARACTERISTICS IN SERBIA Nebojša NOVKOVIĆ, Nataša VUKELIĆ, Blagoje PAUNOVIĆ, Armina HUBANA, Ljiljana DRINIĆ	723
ANALYSIS OF THE PARTICIPATION OF INCENTIVES IN LIVESTOCK IN RELATION TO THE AGRICULTURAL BUDGET OF THE REPUBLIC OF SERBIA Nikola STOLIĆ, Bratislav PEŠIĆ, Nebojša ZLATKOVIĆ, Žarko KOPRIVICA.....	724
ATTITUDES OF FARMERS FROM THE AREAS WITH NATURAL CONSTRAINTS TOWARD AGRICULTURAL AND RURAL DEVELOPMENT SUPPORT Ružica PAPIĆ, Natalija BOGDANOV	725
DEVELOPMENT OF IRRIGATION IN SERBIA FROM 2012 TO 2018 Steve GOSS.....	726
ECONOMIC AND FINANCIAL ASPECTS OF CABBAGE PRODUCTION IN FAMILY FARMS IN THE REPUBLIC OF SERBIA Mladen PETROVIĆ, Bojan SAVIĆ, Nikola LJILJANIĆ, Vedran TOMIĆ, Vojin CVIJANOVIĆ	727
PROFITABILITY OF SMALL-SIZED FARMS IN REPUBLIC OF SERBIA Veljko VUKOJE, Aleksandar MILJATOVIĆ	728
COMPARATIVE ANALYSES OF FOODSTUFF GEOGRAPHICAL INDICATIONS IN SERBIA, BIH AND MONTENEGRO Vlado KOVAČEVIĆ, Dragan BRENJO, Slobodan CVETKOVIĆ.....	729
CONSUMERS' PERSPECTIVES ON ONLINE SHOPPING AND FOOD SAFETY DURING THE COVID-19 PANDEMIC Aysun YENER ÖGÜR, Mustafa DİKMEN, Mehmet Emin YARDIMCI.....	730
IMPACTS OF FIRST WAVE OF THE COVID-19 ON THE AGRICULTURAL PRODUCTION IN TURKEY: ASSESSING THE ROLES OF FARMERS DURING THE PANDEMIC Celal CEVHER, Hakan ADANACIOĞLU, Nilgün DOĞAN	731
EFFECT OF STATE SUBSIDIES GRANTED TO FARMERS FOR CERTIFIED SEEDS ON WHEAT YIELD IN TURKEY Celal CEVHER, Şule COŞKUN CEVHER.....	732
ASSESSING THE IMPACTS OF COVID-19 ON AGRICULTURE FROM THE PERSPECTIVE OF AGRICULTURAL ORGANIZATIONS: A CASE STUDY FROM GÜMÜŞHANE, TURKEY	

Nilgün DOĞAN, Hakan ADANACIOGLU	733
THE USING OF DIGITAL TECHNOLOGIES TO SOLVE PROBLEMS OF RURAL COMMUNITIES	
Orhan ÖZÇATALBAŞ, E. M. C. ADENIDJI, M. KALAYCI, E. N. SARIKAYA	734
THE IMPORTANCE OF RURAL EXTENSION AND ENERGY POLICIES FOR CLEAN AND MODERN ENERGY SOURCES	
Orhan ÖZÇATALBAŞ, M. İMRAN	735
LIVELIHOODS OF SMALL FARM HOUSEHOLDS IN COVID-19 PANDEMIC: A CASE STUDY IN THE RED RIVER DELTA OF VIETNAM	
Nguyen Thi HAI NINH	736
7. FORESTRY AND AGRO-FORESTRY	737
STUDY OF THE QUALITY OF CORK OF NORTHWEST ALGERIA	
Mustapha El Habib FRIHI, Belkheir DEHANE	738
GROWTH OF PEDUNCULATE OAK PROVENANCES ACCORDING TO ALTITUDES AND ECOLOGICAL-VEGETATION REIONIZATION OF THEIR ORIGIN	
Mirzeta MEMIŠEVIĆ HODŽIĆ, Dalibor BALLIAN	739
EFFECT OF LAND USE AND SOIL PROPERTIES ON SOIL TEMPERATURE DISTRIBUTION OF CAMBISOLS IN MOUNTAIN REGIONS	
Milena KERČEVA, Maria GLUSHKOVA, Katerina DONEVA, Stanimir STOINOV, Emiliya VELIZAROVA	740
SEED YIELD IN FOUR PEDUNCULATE OAK (<i>QUERCUS ROBUR</i> L.) PROVENANCES IN CROATIA	
Miran LANŠČAK, Sanja BOGUNOVIĆ, Anđelina GAVRANOVIĆ, Zvonimir VUJNOVIĆ, Mladen IVANKOVIĆ	741
APPLICATION OF UNMANNED AERIAL VEHICLES IN PLANT HEALTH SURVEYS	
Nikola ZORIĆ	742
INFLUENCE OF GENETIC AND ENVIRONMENTAL DIFFERENCES ON MICROPROPAGATION OF WILD CHERRY (<i>PRUNUS AVIUM</i> L.)	
Sanja BOGUNOVIĆ, Ivana BRLEK, Nevenka ČELEPIROVIĆ, Mladen IVANKOVIĆ	743
INITIAL WORK ON THE BREEDING OF EUROPEAN BLACK POPLAR (<i>POPULUS NIGRA</i> L.) IN CROATIA	
Zvonimir VUJNOVIĆ, Saša BOGDAN, Miran LANŠČAK, Sanja BOGUNOVIĆ, Anđelina GAVRANOVIĆ, Mladen IVANKOVIĆ	744
SALT DISTRIBUTION AND POTATO RESPONSE TO IRRIGATION REGIMES UNDER VARYING MULCHING MATERIALS	

Mohamed HASSAN ABD EL-WAHED, Abdulrasoul MOSA AL-OMRAN, Mahmoud MOHAMED HEGAZI, Mahmoud MOHAMED ALI, Yahi Abdelaty MOHAMED IBRAHIM, Ayman EL SABAGH	745
SEEDBALL TECHNOLOGY – A POTENTIAL AFFORESTATION TOOL FOR DRY REGIONS OF THE WORLD	
Charles Ikenna NWANKWO, Ludger HERRMANN	746
LONG-TERM EFFECTS OF OAK DECLINE ON SHRUB INDIVIDUAL'S OCCURRENCES IN AN HUNGARIAN OAK FOREST	
Tamás MISIK, Imre KÁRÁSZ	747
ENGINEERING PROPERTIES OF SOAPNUT (<i>Sapindus emarginatus</i>)	
Paramadhas SUDHA, Keerthiga R.R, Maunica T.P., Mohammed BASHEER, Jikky JAYAKUMAR	748
ASSESSING POLLINOSIS RISK IN THE VESUVIUS NATIONAL PARK (SOUTHERN ITALY): A NOVEL APPROACH FOR INDEX OF URBAN GREEN ZONES ALLERGENICITY	
Antonello PRIGIONIERO, Daniela ZUZOLO, Rosaria SCIARRILLO, Carmine GUARINO	749
BALANCING ECONOMY AND ENVIRONMENTAL ISSUES IN PRIVATE FORESTRY IN LATVIA	
Lelde VILKRISTE	750
QUALITY PARAMETERS EVALUATION OF SPRUCE (<i>PICEA ABIES</i>) SEEDLINGS GROWN AT OPEN-NURSERY CONDITION	
Vilda GRYBAUSKIENE, Gitana VYCIENE	751
AGROFORESTRY BENEFITS NEAR THREATENED SPECIES, BROWN HARE (<i>LEPUS EUROPAEUS</i> L.)	
Olgirda BELOVA	752
RESPONSE OF LIFE FORMS OF UNDERSTORY PLANTS TO CLEAR-CUT LOGGING	
Remigijus DAUBARAS, Laima ČESONIENĖ	753
CHANGES IN FRUIT SIZE AND BIOCHEMICAL COMPOSITION OF VIBURNUM OPULUS FRUITS DURING RIPENING	
Remigijus DAUBARAS, Laima ČESONIENĖ, Pranas VIŠKELIS	754
IMPROVEMENT OF SEED GERMINATION AND SEEDLING RESISTANCE OF BEECH (<i>FAGUS SYLVATICA</i>) BY GROWTH REGULATORS	
Dina ELISOVETCAIA, Raisa IVANOVA, Natalia MASCENCO, Jan BRINDZA	755
NORTHERN TREELINES AS INDICATORS OF CLIMATE AND LAND USE CHANGES. A LITERATURE REVIEW	
Oddvar SKRE	756

MULTIFUNCTIONAL LANDSCAPE AGROFORESTRY SYSTEM ENHANCED THROUGH ECOSYSTEM SERVICES AND BIODIVERSITY	
Fareeha ATHAR, Abdul SHAKOOR, Ayesha MUSTAFA, Ifra SALEEM, Majid NADEEM.....	757
USE OF THE TERRESTRIAL LASER SCANNER TO ESTIMATE BIOMASS PRODUCTION IN HYBRID POPLAR CROPS	
Iulian Constantin DĂNILĂ.....	758
EVALUATION OF RELEVANT MINERAL CONTENTS OF MEDICINAL WILD-GROWN MUSHROOM <i>GANODERMA LUCIDUM</i> FROM DIFFERENT ROMANIAN AREAS	
Miruna-Florentina POPA, Oana DANCI, Cristian BANCIU, Gabriel-Mihai MARIA , Simona OANCEA	759
DETERMINATION OF SPRUCE (<i>PICEA OBOVATA</i> LEDEB.) TRUNK DIAMETER BASED ON STUMP DIAMETER IN DIFFERENT BOREAL CONIFEROUS FOREST CONDITIONS OF PERMSKII KRAI	
Aleksandr ROMANOV, Andrey ANTIPIN.....	760
FLORISTIC COMPOSITION COMPARISON BETWEEN AUSTRIAN PINE FORESTS OF ZLATIBOR AND KOPAONIK (SERBIA)	
Marijana NOVAKOVIĆ-VUKOVIĆ, Rajko MILOŠEVIĆ	761
COMPARATIVE ANALYSIS OF FLORISTIC COMPOSITION OF HUNGARIAN OAK AND TURKEY OAK FORESTS ON TWO LOCALITIES IN SERBIA	
Marijana NOVAKOVIĆ-VUKOVIĆ, Rajko MILOŠEVIĆ, Marko PEROVIĆ.....	762
TAXONOMICAL PROPERTIES OF GREEK MAPLE (<i>ACERHELDREICHII</i> ORPH.) ON JAHORINA MOUNTAIN IN BOSNIA AND HERZEGOVINA	
Nikola ZORANOVIĆ, Marko PEROVIĆ, Rade CVJETIĆANIN.....	763
THE CYNIPID GALL WASPS FAUNA ON PEDUNCULATE OAK IN THE SEED ORCHARD IN SREMSKA MITROVICA (SERBIA)	
Milan DREKIĆ, Leopold POLJAKOVIĆ- PAJNIK, Saša ORLOVIĆ, Branislav KOVAČEVIĆ, Marina MILOVIĆ, Andrej PILIPOVIĆ.....	764
ANALYSIS OF THE ECOLOGICAL-CENOLOGICAL RELATION AND VITALITY OF ARTIFICIALLY RAISED STANDS OF ASH AND BLACK PINE IN PROTECTIVE FOREST IN VICINITY OF BELGRADE (SERBIA)	
Rajko MILOŠEVIĆ, Marijana NOVAKOVIĆ-VUKOVIĆ, Milan BIĆANIN	765
NON-LINEAR MODELS APPLICATIONS IN RADIAL GROWTH PREDICTION STUDIES, BASED ON CLIMATE SCENARIOS: GENERALIZED ADDITIVE MIXED MODEL (GAMM) APPROACH	
Saša KOSTIĆ, Saša ORLOVIĆ, Lazar KESIĆ, Martina ZORIĆ, Stefan STJEPANOVIĆ, Dejan B. STOJANOVIĆ	766

EUGLEY SOIL OF FLOODPLAIN AND PROTECTED PART OF ALUVIAL PLANE AND POSSIBILITIES OF THEIR FORESTATION	
Saša PEKEČ, Andrej PILIPOVIĆ, Marina MILOVIĆ, Velisav KARAKLIĆ	767
COMPARISON OF THE GROUND VEGETATION IN DOUGLAS-FIR ARTIFFICIALY ESTABLISHED STANDS AND NATURAL MIXED BEECH AND SESSILE OAK FOREST IN THE AREA OF KOSMAJ (SERBIA)	
Snežana STAJIĆ, Vlado ČOKEŠA, Zoran MILETIĆ, Saša EREMIJA, Miroslava MARKOVIĆ ..	768
WATER SUPPLY EFFECT ON PHYSIOLOGICAL STATUS OF MANAGED AND UNMANAGED PEDUNCULATA OAK (<i>QUERCUS ROBUR</i> L.) STANDS IN RELATION TO RIVERBED DISTANCE	
Srđan STOJNIĆ, Mirjana BOJOVIĆ, Saša ORLOVIĆ, Dejan B. STOJANOVIĆ, Saša KOSTIĆ, Lazar KESIĆ, Matjaž ČATER.....	769
THE CHAOTIC WHEAT PRODUCTION GROWTH MODEL: CHINA	
Vesna JABLANOVIC.....	770
MORPHOLOGICAL CHARACTERISTICS AND VARIABILITY OF THE SEEDLINGS OF WILD CHERRY (<i>PRUNUS AVIUM</i> L.) IN SERBIA	
Vladan POPOVIĆ, Ljubinko RAKONJAC, Ivica LAZAREVIĆ, Aleksandar LUČIĆ.....	771
VARIABILITY OF MORPHOMETRIC CHARACTERISTICS OF SESSILE OAK (<i>QUERCUS PETRAEA</i> (MATT.) LIEBL) ACORN	
Vladan POPOVIĆ, Aleksandar LUČIĆ, Sanja JOVANOVIĆ, Ljubinko RAKONJAC	772
SOCIO ECONOMIC STATUS & AGROFORESTRY READINESS: A CASE STUDY OF SELECTED COMMUNITIES IN THE OR TAMBO DISTRICT, EASTERN CAPE IN SOUTH AFRICA	
Phokele MAPONYA, Dean OELOFSE, Casper MADAKADZE, Nokwazi MBILI, Zakheleni DUBE, Thabo NKUNA, Meshack MAKHWEDZHANA, Takalani TAHULELA , Kgosi MONGWAKETSI	773
SUITABILITY OF WOOD OF NATIVE OAK SPECIES (<i>QUERCUS</i> spp.) FROM THE IBERIAN PENINSULA NORTHWEST FOR COOPERAGE	
Ignacio J. DIAZ-MAROTO	774
CERTIFICATION SYSTEM FOR SUSTAINABLE FOREST MANAGEMENT OF CORK TREE (<i>QUERCUS SUBER</i> L.) FORESTS	
Ignacio J. DIAZ-MAROTO	775
DETERMINATION OF <i>SALVIA OFFICINALIS</i> L. VOLATILE CONSTITUENTS BY SPME METHOD	
Musa TÜRKMEN	776
CHANGE OF ESSENTIAL OIL RATIO AND COMPONENTS OBTAINED BY DIFFERENT METHODS IN LAUREL AND MYRTLE PLANTS	

Musa TÜRKMEN, Oğuzhan KOÇER	777
AUTHOR INDEX	778

BLUE LED LIGHT PROMOTES SOMATIC EMBRYOGENESIS FROM THE LATERAL ROOTS SECTIONS OF SPINACH (*SPINACIA OLERACEA* L)

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Abstract

Light and gibberellins (GAs) are essential for the induction of somatic embryogenesis in spinach. In the present study, the influence of light of different spectral qualities on the induction of somatic embryogenesis from the apical root sections of spinach seedlings was tested. The explants grown under blue light (B, emission maximum at 460 nm), provided by Light-emitting diodes (LED), exhibited the highest regeneration frequency ($57.8\% \pm 0.36$) and the mean somatic embryo (SE) number per explant (5.02 ± 0.04) for eight weeks of cultivation on SE-induction medium supplemented containing $20 \mu\text{M}$ α -naphthaleneacetic acid and $5 \mu\text{M}$ GA₃. The explants cultivated under white (W, 300-720 nm) LED or light provided by fluorescent lamps (FL, 380-680) produced a two times lower number of SEs per explant, while the explants grown under red (R, 630 nm) LED light or in darkness (D) failed to regenerate SEs. Considering that light greatly affects the level of GAs in plant tissues, and GAs are indispensable for SE induction in spinach, the expression profiles of genes encoding the key enzymes that catalyze the final steps of bioactive GA biosynthesis (GA20-oxidase and GA3-oxidase) and inactivation (GA2-oxidase) were tested in the explants grown under B, W or FL light. Surprisingly, no significant differences in the expression levels of these genes were observed among the treatments during of SE induction, indicating that light triggers SE induction by other mechanism, not including alterations in the expression of the aforementioned genes. Further research is needed for better understanding of the mechanism of SE induction by light.

Key words: *spinach, somatic embryogenesis, gibberellins, LED lights, gene expression.*