

# AgroSym 2019

# AGRO 2019 sym

Faculty of Agriculture  
University of East Sarajevo



Republic of Srpska  
Bosnia and Herzegovina

Faculty of Agriculture  
University of Belgrade



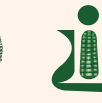
Serbia

CIHEAM - Mediterranean  
Agronomic Institute of  
Bari (CIHEAM - IAMB)



Italy

in collaboration with



Jahorina, 03-06 October 2019, Bosnia and Herzegovina

## SYMPOSIUM PROGRAMME

- P 276 THE LEVEL OF WINTER WHEAT STEM BASE DISEASES IN THE DEPENDENCE ON THE INTENSITY OF PLANT PROTECTION**, Marta DAMSZEL, Tomasz P. KUROWSKI
- P 277 THE INFLUENCE OF FORECROPS AND CATCH CROPS ON THE SPECIES COMPOSITION OF FUNGI IN THE SOIL AND ON THE HEALTHINESS OF OAT**, Elżbieta MIELNICZUK, Elżbieta PATKOWSKA, Agnieszka JAMIOŁKOWSKA
- P 278 REAL-TIME PCR METHOD FOR QUANTITATIVE EVALUATION OF ABUNDANCE CHITINOLYTIC BACTERIA USED IN BIOLOGICAL CONTROL**, Sebastian Wojciech PRZEMIENIECKI, Jędrzej MASTALERZ, Karol KOTLARZ, Tomasz Paweł KUROWSKI
- P 279 THE EFFECT OF RYE-RICH DIET ON THE LEVEL OF PROINFLAMMATORY CYTOKINES IN PIGS**, Sylwester KOWALIK, Magdalena GRODZKA, Paulina LEŚNIAK, Agnieszka CHAŁABIS-MAZUREK, Jose Luis VALVERDE PIEDRA, Ewa TOMASZEWSKA, Sylwia SZYMANCZYK, Marcin ARCISZEWSKI, Anna ZACHARKO, Siemowit MUSZYŃSKI, Piotr DOBROWOLSKI, Tomasz SCHWARZ
- P 280 FOOD IRRADIATION AS A KEY TO REDUCE FOOD WASTE AND GUARANTEE FOOD SAFETY**, Amilcar L. ANTONIO, Isabel C.F.R. FERREIRA, Pedro M.P. SANTOS, Sandra CABO VERDE
- P 281 PHYSICO-CHEMICAL AND MICROBIOLOGICAL ANALYSIS OF JUICE EXTRACTED FROM SWEET SORGHUM**, Georgiana-Luminița MIHĂILĂ, Sorin-Ștefan BIRIȘ
- P 282 COMPARATIVE EVALUATION OF MOLECULAR METHODS USED FOR FUSARIUM STRAINS IDENTIFICATION IN THE WEST PART OF ROMANIA**, Sorina POPESCU, Dorica BOTAU, Aurica BOROZAN, Ioan SARAC, Oana-Maria BOLDURA
- P 283 STUDY OF BIOLOGICAL EFFECTIVENESS AND DYNAMICS OF THE DESTRUCTION PREPARATIONS BASED ON NEONICOTINOIDS AND PYRETHROIDS ON CEREALS**, Ilya KASATOV, Anton POLIKARPOV, Yuriy SAVUSHKIN, Elena TESTOVA, Anastasia FILATOVA
- P 284 SELECTION PROSPECTS OF *PHYSALIS ANGULATA* IN MODERATE CLIMATE OF THE RF NON-CHERNOZEM BELT**, Myazar ENGALYCHEV, Irina KONDRATYEVA
- P 285 STUDY OF BIOLOGICAL EFFECTIVENESS AND DYNAMICS OF THE DESTRUCTION PREPARATIONS BASED ON NEONICOTINOIDS AND PYRETHROIDS ON CEREALS**, Iliya KASATOV, Anton POLIKARPOV, Yuriy SAVUSHKIN, Elena TESTOVA, Anastasia FILATOVA
- P 286 EFFECTOR DIVERSITY OF *PHYTOPHTHORA INFESTANS* POPULATION IN EGYPT**, S. M. EL-GANAINY, A. M. TOHAMY, M. A. AWAD, D. E.L. COOKE
- P 287 CONTROL OF APHIDIDAE IN CHRYSANTHEMUM UNDER GREENHOUSE PRODUCTION**, Slavica VUKOVIĆ, Sanja LAZIĆ, Dragana ŠUNJKA, Antonije ŽUNIC, Dragana BOŠKOVIĆ
- P 288 EFFECTS OF TEA WOOD ESSENTIAL OIL ON *TRIBOLIUM CONFUSUM* DU VAL. AND *ORYZAEPHILUS SURINAMENSIS* L.**, Dragana BOŠKOVIĆ
- P 289 PHENOLIC COMPONENTS AND ANTIOXIDANT ACTIVITIES IN VARIOUS TYPES OF CARROT EXTRACTS**, Jelena MLADENOVIĆ, Ljiljana BOŠKOVIĆ-RAKOČEVIĆ, Milena ĐURIĆ, Jasmina ZDRAVKOVIĆ, Nenad PAVLOVIĆ, Marijana DUGALIĆ
- P 290 ANTIMICROBIAL FEATURES OF ETHANOL EXTRACT MUSHROOM *CORIOLUS VERSICOLOR***, Jelena PANTOVIĆ, Sasa DESPOTOVIĆ
- P 291 INFLUENCE OF BIOTIC STRESS ON TURKEY OAK SEEDLINGS IN ELEVATED CO<sub>2</sub> CONDITIONS**, Slobodan MILANOVIĆ, Jovan DOBROSAVLJEVIĆ, Nemanja KAŠIĆ, Marija POPOVIĆ, Ivan MILENKOVIĆ, Stefan BOJIĆ, Čedomir MARKOVIĆ
- P 292 INFLUENCE OF INOCULATION OF *Q. CERRIS* SEEDLINGS WITH A ROOT PATHOGEN *P. PLURIVORA* ON THE PERFORMANCE OF *L. DISPAR* LARVAE UNDER EXTREMELY ELEVATED CO<sub>2</sub> LEVEL CONDITIONS**, Slobodan MILANOVIĆ, Jovan DOBROSAVLJEVIĆ, Nemanja KAŠIĆ, Marija POPOVIĆ, Ivan MILENKOVIĆ, Stefan BOJIĆ, Čedomir MARKOVIĆ
- P 293 THE INFLUENCE OF ABIOTIC FACTORS IN DEVELOPMENT OF CODLING MOTH AND ITS NATURAL ENEMIES IN SOUTHERN SERBIA**, Katerina NIKOLIC, Ana SELAMOVSKA, Slaviša GUDŽIĆ, Zoran NIKOLIĆ, Dragan GRČAK, Milosav GRČAK
- P 294 PRESENCE OF DEOXYNIVALENOL IN BREAD IN SERBIA DURING 2018-2019**, Marko M. JAUKOVIĆ, Veselinka M. ZEČEVIĆ, Milica J. NIKOLIĆ

# FOOD IRRADIATION AS A KEY TO REDUCE FOOD WASTE AND GUARANTEE FOOD SAFETY

Amilcar L. ANTONIO<sup>1\*</sup>, Isabel C.F.R. FERREIRA<sup>1</sup>, Pedro M.P. SANTOS<sup>2</sup>, Sandra CABO VERDE<sup>2</sup>

<sup>1</sup>Mountain Research Center (CIMO), Polytechnic Institute of Bragança, Portugal

<sup>2</sup>Center for Nuclear Sciences and Technologies (C2TN), Higher Technical Institute, University of Lisbon, Portugal

\*Corresponding author: [amilcar@ipb.pt](mailto:amilcar@ipb.pt)

## Abstract

Food waste is being in the focus of recent global policies, to tackle food scarcity and to overcome “nutritional poverty” in several countries. Otherwise, a global food market is being the key to make available several products to different populations. These vectors for food policy must be supported by several orientations, to attain their final objective: better and enough food for the world population. For that, different post-harvest processing technologies are making their fundamental contribute. Among that, the preservation of food by irradiation, a physical process that does not use chemicals, is making its way in several countries, to accept imported or exported products without pests (insects), without foodborne pathogens, and also to extend the shelf life of processed products, stopping enzymatic degradation and reducing microorganisms that contribute for food spoilage. We have been studying the effects of gamma and e-beam radiation for food preservation of several Mediterranean products, including chestnuts, mushrooms and aromatic plants, berries and tomatoes, using an experimental gamma chamber with <sup>60</sup>Co sources and an electron accelerator with the maximum energy of 10 MeV. And here we present these technologies, their limitations and advantages, the effects on relevant properties of food (*e.g.* color, texture, nutritional parameters), and question why food preservation by irradiation is underused, since its first use has more than 100 years and its first industrial application has more than 50 years.

**Keywords:** *Food technology; Food safety; Post-harvest technologies; Food irradiation.*

## Reference

“*Food Irradiation Technologies: Concepts, Applications and Outcomes*”. I.C.F.R. Ferreira, A.L. Antonio, and S. Cabo Verde (Editors), RSC, UK, 2018

## Acknowledgements

FCT (Portugal), FEDER PT2020 (UID/AGR/00690/2019), C2TN (UID/Multi/04349/2013), IAEA CRP D61024.