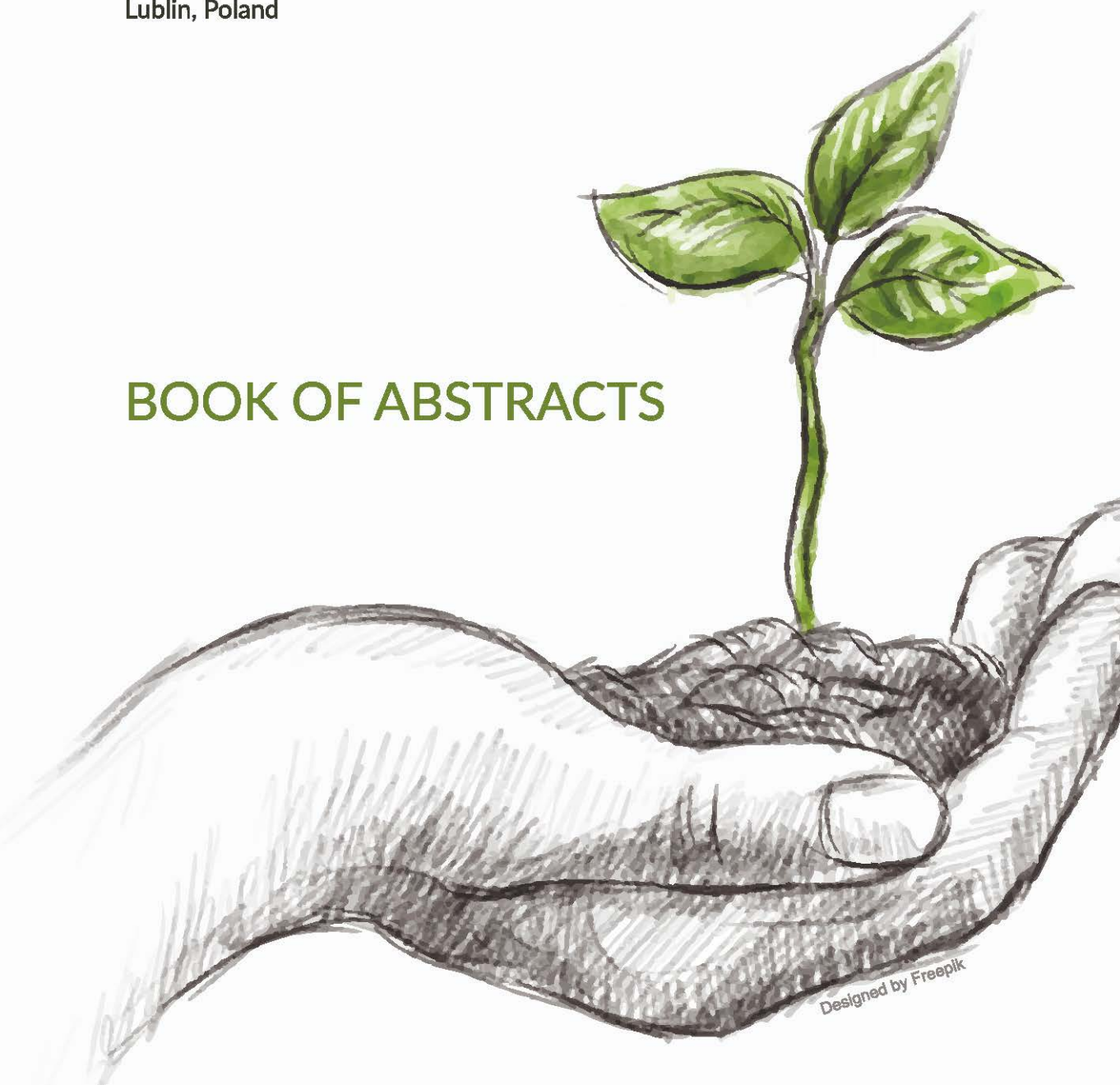


# ICA 2018

12th International Conference on Agrophysics:  
*Soil, Plant & Climate*

17<sup>th</sup>-19<sup>th</sup> September, 2018  
Lublin, Poland

BOOK OF ABSTRACTS



Designed by Freepik

# ICA 2018

12th International Conference on Agrophysics:  
*Soil, Plant & Climate*

## BOOK OF ABSTRACTS

Conference Organisers:

Institute of Agrophysics, Polish Academy of Sciences

Foundation of the Polish Academy of Sciences

Polish Academy of Sciences Branch in Lublin

Ministry of Science and Higher Education of the Republic of Poland

LUBLIN, 2018

Edited by: Cezary Sławiński, Artur Zdunek  
Cover design: Freepik, Damian Bieniek  
Computer type setting: Piotr Pieczywek

Copyright © 2018 by Institute of Agrophysics, Polish Academy of Sciences

Edition: 180 copies

Printed by: Perfekta info Paweł Markisz, ul. Doświadczalna 48, 20-280 Lublin

ISBN 978-83-89969-59-0

The conference is co-financed in frame of task: Organization of International Conference on Agrophysics (ICA): Soil, Plant & Climate – task financed under contract No. 878/P-DUN/2017 from the Ministry of Science and Higher Education dedicated to the dissemination of science.



## SCIENTIFIC BOARD

### **Tatiana Alekseeva**

Institute of Physicochemical and Biological Problems of Soil Science, Russian Academy of Sciences, Pushchino, Russia

### **Krystyna Malińska**

Institute of Environmental Engineering, Faculty of Infrastructure and Environment, Częstochowa University of Technology, Poland

### **Bénédicte Bakan**

INRA BIA, Nantes, France

### **Marek Molenda**

Institute of Agrophysics, PAS, Poland

### **Piotr Baranowski**

Institute of Agrophysics, PAS, Poland

### **Bart Nicolai**

KU Leuven, Belgium

### **Andrzej Bieganowski**

Institute of Agrophysics, PAS, Poland

### **Sara Posé**

University of Malaga, Spain

### **Wioletta Błaszczak**

Institute of Animal Reproduction and Food Research, Polish Academy of Sciences in Olsztyn, Poland

### **Giancarlo Renella**

University of Florence, Italy

### **Magdalena Frąć**

Institute of Agrophysics, PAS, Poland

### **Reimund Paul Rötter**

Georg-August-Universität Göttingen, Germany

### **Rainer Horn**

Christian-Albrechts-Universität zu Kiel, Germany

### **Zofia Sokołowska**

Institute of Agrophysics, PAS, Poland

### **Yakov Kuzyakov**

RUDN University, Moscow

### **Joachim Venus**

Leibniz Institute for Agricultural Engineering and Bioeconomy, Germany

### **Marc Lahaye**

INRA BIA, Nantes, France

### **Timo Vesala**

Institute for Atmospheric and Earth System Research, University of Helsinki, Finland

## LOCAL ORGANISING COMMITTEE

Emilia Bronisz

Monika Chylińska

Justyna Cybulska

Magdalena Gos

Katarzyna Jaromin-Gleń

Krzysztof Lamorski

Karolina Oszust

Agata Pacek-Bieniek

Piotr Pieczywek

Krzysztof Sitarz

Monika Szymańska-Chargot

Ewa Wnuk

Artur Zdunek (chairman)

Jarosław Zdunek

# CONFERENCE PROGRAMME

## 12<sup>th</sup> International Conference on Agrophysics: Soil, Plant & Climate

### 16<sup>th</sup> September, Sunday

18:00-20:00

Registration and Welcome reception

### 17<sup>th</sup> September, Monday

8:00 - 9:15

Registration

9:15 - 9:30

Opening ceremony

9:30 - 10:10

**Opening lecture**

**Vesala, T.** - Forest harvesting and climate and a public discourse (pp.18)

10:10 - 11:00

Coffee break

#### Session I – Soil & Plant

Chairman: **Giancarlo Renella**

#### Session IV – Fruit Structure workshop

Chairman: **Justyna Cybulska**

11:00 - 11:30

**Keynote**

**Kuzyakov, Y.** - Rhizosphere links the above- and belowground processes (pp.19)

**Keynote**

**Posé, S.** - Relevance of pectin nanostructure on strawberry fruit mechanical features - a case study under the AFM stylus (pp.34)

11:30 - 11:50

**Nowak, K.** - Fungal polysaccharides as a new sorbent (pp.20)

**Lahaye, M.** - Water dynamics and cell wall polysaccharides assessment of apple viscoelastic mechanical properties (pp.35)

11:50 - 12:10

**Fueki, N.** - Organic farming affects soil physical properties – study results conducted in Poland and Japan (pp.21)

**Brandes, N.** - Field adjusted irrigation requirements of Highbush Blueberry (*Vaccinium corymbosum* L.) considering fruit developmental stage (pp.36)

12:10 - 12:30

**Correia, C.** - Dynamics of minerals and nutrient imbalances in olive leaves under tillage and annual legume cover crops (pp.22)

**Leszczuk, A.** - Distribution of arabinogalactan proteins (AGPs) in fruit cell wall (pp.37)

12:30 - 12:50

**Alekseev, A.** - Soils response to the land use and soil climatic gradients at ecosystem scale (pp.23)

**Leca, A.** - NMR and texture measurements to characterize the evolution of apple microstructure during thermal treatment (pp.38)

13:00 - 14:00

Lunch

## TABLE OF CONTENTS

ORAL PRESENTATIONS	Page no
Forest harvesting and climate and a public discourse <b>Vesala, T.</b> , Bäck, J.	18
Rhizosphere links the above- and belowground processes <b>Kuzyakov, Y.</b>	19
Fungal polysaccharides as a new sorbent <b>Nowak, K.</b> , Bieganski, A., Wiater, A., Waško, A.	20
Organic farming affects soil physical properties – study results conducted in Poland and Japan <b>Fueki, N.</b> , Lipiec, J., Kuś, J., Kotowska, U., Nosalewicz, A., Tanifuji, K.	21
Dynamics of minerals and nutrient imbalances in olive leaves under tillage and annual legume cover crops <b>Correia, C.</b> , Martins, S., Silva, E., Brito, C., Pinto, L., Moutinho-Pereira, J., Gonçalves, A., Arrobas, M., Rodrigues, M. A.	22
Soils response to the land use and soil climatic gradients at ecosystem scale <b>Alekseev, A.</b> , Alekseeva, T., Kalinin, P., Hajnos, M.	23
Impact of Cu <sup>II</sup> ions on herbicide mesotrione fate in contrasting soils <b>Alekseeva, T.</b> , Besse-Hoggan, P., Pinsky, D.	24
Pore size distribution and adsorption properties of soils with different texture <b>Kercheva, M.</b> , Sokołowska, Z., Hajnos, M.	25
A soil quality index for the agricultural area under different level of anthropopressure <b>Klimkowicz-Pawlas, A.</b> , Ukalska-Jaruga, A., Smreczak, B.	26
About the influence of clay content to the distribution of soils into P status groups by AL, DL and MEGLICH 3 method <b>Toomsoo, A.</b> , Jürgens, M., Kölli, R., Kaart, T., Kauer, K., Tõnutare, T.	27
Laboratory measurement methods of splash erosion in micro scale <b>Ryżak, M.</b> , Beczek M., Mazur, R., Sochan, A., Korbiel T., Lamorski K., Bieganski A.	28
Opportunities and current limits of omic approaches in soil microbial ecology <b>Renella, G.</b>	29
Active role of AgroNanoGel on microbial biodiversity in the sandy soil at different water potential Kuzniar, A., Wolińska, A., Widomski, M.K., Stępniewska, Z., <b>Stępniewski, W.</b>	30
Indication of root stress using phase shift measurement <b>Rajkai, K.</b> , Vozáry, E., Cseresnyés, I.	31
Crop response to combined action of drought and other abiotic stresses <b>Nosalewicz, A.</b> , Siecińska J., Kondracka K., Vitková, J., Šurda, P.	32
Petriella setifera – Intraspecific functional and genetic diversity <b>Pertile, G.</b> , Panek, J., Oszust, K., Siczek, A., Frąc, M.	33
Relevance of pectin nanostructure on strawberry fruit mechanical features - a case study under the AFM stylus <b>Posé, S.</b>	34
Water dynamics and cell wall polysaccharides assessment of apple viscoelastic mechanical properties <b>Lahaye, M.</b> , Bouin, C., Barbacci, A., Le Gall, S., Foucat, L.	35
Field adjusted irrigation requirements of Highbush Blueberry ( <i>Vaccinium corymbosum</i> L.) considering fruit developmental stage <b>Brandes, N.</b> , Tsoulas, N., Zude-Sasse, M.	36

## **Dynamics of minerals and nutrient imbalances in olive leaves under tillage and annual legume cover crops**

Correia, C.<sup>1</sup>, Martins, S.<sup>1</sup>, Silva, E.<sup>1</sup>, Brito, C.<sup>1</sup>, Pinto, L.<sup>1</sup>, Moutinho-Pereira, J.<sup>1</sup>, Gonçalves, A.<sup>1</sup>, Arrobas, M.<sup>2</sup>, Rodrigues, M. A.<sup>2</sup>

<sup>1</sup> Centre for the Research and Technology of Agro-Environmental and Biological Sciences, University of Trás-os-Montes e Alto Douro, 5000-801 Vila Real, Portugal; ccorreia@utad.pt

<sup>2</sup> Mountain Research Centre – Polytechnic Institute of Bragança, Campus de Santa Apolónia, 5300-253 Bragança, Portugal

The concentration of minerals in leaves depends on phenology, crop yield, soil characteristics, environmental conditions and agronomic practices. This study was undertaken to compare the dynamics of minerals of olive rainfed trees under tillage (two per year) with trees in consociation with a mixture of 11 early season self-reseeding legumes. The results of leaf minerals concentrations, on both treatments, showed similar variation between sampling dates, with higher levels of N, P, K, B and Zn found in summer, at endocarp sclerification, and of Ca, Mg, Fe and Mn at winter resting period, resulting in statistically significant changes on nutrient ratios, with higher Ca, Mg, Fe and Mn-to-N and Ca:Mg and Fe:Mn ratios and lower K, P, B, Cu and Zn-to-N and K:Ca, K:Mg, Cu:Zn, Zn:Fe and Zn:Mn ratios during winter. Trees of plots managed with the cover crop had higher concentrations of N, Mg and Mn, in close association with leaf water status, photosynthetic activity and crop yield. Moreover, legumes plots presented significant higher Mg and Mn-to-N ratios and lower P, Fe and B-to-N ratios, as well lower K:Mg, Ca:Mg, Fe:Mn and Zn:Mn ratios on both dates, and lower K and Cu-to-N ratios during summer. Although only Cu values were higher than typical sufficient levels, important relative nutrient changes were found. Phosphorus and Mg-to-N ratios were above the optimal ratios for olive leaves, on both seasons, the Fe: N ratio was over during winter, the Mn:N ratio was higher under cover crop, the K:N ratio was lower at winter and Ca:N was below the reference levels during summer. These results highlighted that nutrient ratios can be more indicative than nutrient concentrations regarded as optimal for olive. It is important to standardise the procedures for leaf sampling and to define target values for nutrient ratios in different conditions, in order to detect and, if necessary, to correct nutrient imbalances.

### **Acknowledgements**

This work was funded by the INTERACT project – “Integrative Research in Environment, Agro-Chains and Technology”, no. NORTE-01-0145-FEDER-000017, in its lines of research entitled ISAC, co-financed by the European Regional Development Fund (ERDF) through NORTE 2020 (North Regional Operational Program 2014/2020).