

III International Symposium on Soilless Culture and Hydroponics:

Innovation and advanced technology for circular horticulture

ISHS International Symposium



Program

09:00-09:30 Welcome Ceremony and Opening Remarks
 Moderator: *Stefania De Pascale, University of Naples, Italy*
Nikolaos Tzortzakis-convener- Welcoming
Panayiotis Zaphiris-CUT Rector- Welcoming
Stefania De Pascale- ISHS-Welcoming and ISHS presentation
Silvana Nicola-co-convener -Welcoming and starting

09:30-11:00 Session I: Indoor Farming and Microclimate
 Moderator: *Silvana Nicola, University of Turin, Italy*

Invited lecture

L1 09:30-10:00 The Colourful Life of Plants in Indoor Farming
Leo F.M. Marcelis, Wageningen University, The Netherlands

Oral Communications

O1 10:00-10:15 Effect of supplementary light on growth, yield and fruit quality of two tomato cultivars grown in High-Tech glasshouse
Abdulaziz Alharbi, National Research and Development Center for Sustainable Agriculture, Kingdom of Saudi Arabia

O2 10:15-10:30 Microclimate analysis to test the performance of an experimental two-level unit in the hydroponic greenhouse
Helena Vitoshkin, Institute of Agricultural Engineering, Agricultural Research Organization, The Volcani Center, Israel

O3 10:30-10:45 Evolution of soilless culture in Chile
Gilda Carrasco, University of Talca, Chile

10:45-11:00 Question time/Remarks

11:00-11:15 Coffee break

11:15-13:00 Session II: Soilless Culture and Substrates
 Moderator: *Wim Voogt, Wageningen University and Research, The Netherlands*

Oral Communications

O4 11:15-11:30 Peat reduced substrates for vegetable seedlings
Nazim Gruda, University of Bonn, Germany

O5 11:30-11:45 The effects of irrigation frequency on water and heat regimes in different substrates and their mixtures: tomato as a case study
Asher Bar-Tal, Institute of Soils, Water and Environmental Science, ARO, The Volcani Center, Israel

O6 11:45-12:00 Opportunities and challenges of using non-thermal plasma treatments in soilless cultures: experience from greenhouse experiments
Daniele Massa, CREA Research Centre for Vegetable and Ornamental Crops, Italy

O7 12:00-12:15 Closed nutrient solution systems in Portuguese tomato greenhouses
Margarida Oliveira, Polytechnic Institute of Santarém, Portugal

12:15-12:20 Question time/Remarks

12:20-13:00 Round table- Discussion forums (DF)
DF1: Water and Nutrition Management
 Moderator: *Wim Voogt-The Netherland*
DF2: New Technology
 Moderator: *Silvana Nicola-Italy*

13:00-14:00 Lunch break



Programme- Friday, March 19, 2021

14:00-15:30 Session III: Biocontrol and Bionutrition in Soilless Culture
Moderator: Antonios Chrysargyris, Cyprus University of Technology, Cyprus

Invited lecture

L2 14:00-14:30 Biological Control of Root Pathogens in Soilless Cultures
Monica Höfte, Ghent University, Belgium

Flash poster presentation

14:30-15:30 Flash poster presentation (No 1-21)
15:30-15:45 Coffee break

15:45-17:10 Session III: Biocontrol and Bionutrition in Soilless Culture
(continue)
Moderator: Haissam Jijakli, University of Liege, Belgium

Oral Communications

O8 15:45-16:00 Treatment of biofilm formation in irrigation lines in zero liquid discharge cultivation systems
Jim Van Ruijven, Wageningen University and Research, The Netherlands

O9 16:00-16:15 Survival and transfer of Salmonella Enteritidis in lettuce cultivated in hydroponics as affected by different pH of nutrient solution
Panayiota Xylia, Cyprus University of Technology, Cyprus

O10 16:15-16:30 Potential accumulation of cleaning products in closed soilless culture systems
Erik Van Os, Wageningen University and Research, The Netherlands

O11 16:30-16:45 Organic Hydroponics: A US Reality Challenging the Traditional Concept of `Organic` and `Soilless` Cultivation
Francesco Di Gioia, The Pennsylvania State University, United States of America

O12 16:45-17:00 Organic sources of nutrient supply for tomatoes and asian herbaceous vegetables in soilless culture systems
Michael Böhme, Humboldt-Universität zu Berlin, Germany

17:00-17:10 Question time/Remarks



Programme- Saturday, March 20, 2021

09:00-09:15 **Opening Remarks**
Nikolaos Tzortzakis-Silvana Nicola

09:15-11:00 **Session IV: Nutrient Solution Management & Salinity**
Moderator: Stefania De Pascale, University of Naples, Italy

Invited lecture

L3 09:15-09:45 **Optimizing Plant Nutrition in Open and Closed Hydroponic Systems**
Dimitrios Savvas, Agricultural University of Athens, Greece

Oral Communications

O13 09:45-10:00 **Tailor-made hydroponic recipes for the production of high quality medicinal and aromatic plants**

Antonios Chrysargyris, Cyprus University of Technology, Cyprus

O14 10:00-10:15 **Effect of different nitrogen fertilization levels on plant growth performance, yield and 6-gingerol content of ginger (*Zingiber officinale* Roscoe) cultivated in soilless culture system**

Yaseer Suhaimi Mohd, Malaysian Agricultural Research and Development Institute, Malaysia

O15 10:15-10:30 **Development of a robust nitrate sensor for online measurements**

Geert Franken, Wageningen University and Research, The Netherlands

O16 10:30-10:45 **Influence of different ammonium and nitrate ratio on yield and quality of rocket**

Antonio Ferrante, University of Milan, Italy

10:45-11:00 Question time/Remarks

11:00-11:15 Coffee break

11:15-13:00 **Session IV: Nutrient Solution Management & Salinity (continue)**
Moderator: Daniele Massa, CREA Research Centre for Vegetable and Ornamental Crops, Italy

Oral Communications

O17 11:15-11:30 **Performance of hydroponic Pak choi (*Brassica rapa* subsp. *chinensis*) under elevated sodium conditions**

Andrej Svyantek, North Dakota State University, United States of America

O18 11:30-11:45 **Dealing with Na accumulation in soilless grown crops with recirculation of drainage**

Wim Voogt, Wageningen University and Research, The Netherlands

O19 11:45-12:00 **Evaluation of lettuce (*Lactuca sativa*) production under hydroponic system; organic liquid versus mineral nutrient solution**

Zienab Ahmed, United Arab Emirates University, United Arab Emirates

12:00-12:10 Question time/Remarks

12:10-12:20 Meet the sponsors

- SQM (Koen D'Haeyer)
- Urbinati s.r.l. (Alessandro Mazzacano)

12:20-13:00 **Round table- Discussion forums (DF)**

DF3: Organic Hydroponics: Research need and Future Perspectives

Moderator: Franscesco Di Goia- United States of America

DF4: Aquaponics

Moderator: Ranka Junge- Switzerland

13:00-14:00 Lunch break



Programme- Saturday, March 20, 2021

14:00-15:30 **Session V: Aquaponics and Urban Farming**

Moderator: *Andrea Ertani, University of Turin, Italy*

Invited lecture

- L4 14:00-14:30 Urban Agriculture: An Emerging Sector Stimulating Research and Innovation on Soilless Culture Including Hydroponics and Aquaponics**

Haissam Jijakli, University of Liege, Belgium



Flash poster presentation

14:30-15:30 Flash poster presentation (No 22-43)

15:30-15:45 Coffee break

15:45-17:10 **Session V: Aquaponics and Urban Farming** (continue)

Moderator: *Ranka Junge, Zurich University of Applied Sciences, Switzerland*

Oral Communications

- O20 15:45-16:00 Water efficient food production in the north**
Siv Lene Skar, NIBIO - Norwegian Institute for Bioeconomy, Norway
- O21 16:00-16:15 Utilization of run-off nitrate from recirculating aquaculture systems for hydroponic crop cultivation**
Oyvind M. Jakobsen, CIRiS, NTNU Social Research, Norway
- O22 16:15-16:30 Microorganisms in aquaponics: insights on their functions and the kinetics of their communities' evolution over the course of a full lettuce growth cycle**
Mathilde Eck, University of Liege, Belgium.
- O23 16:30-16:45 Microbiome and C supply strategies for the rooting medium of an urban rooftop vegetable farm**
Bart Vandecasteele, ILVO, Belgium
- O24 16:45-17:00 Life Cycle Assessment for the determination of key environmental impact indicators in soilless tomato culture and mitigation potential**
Vassilios Litskas, Cyprus University of Technology, Cyprus
- 17:00-17:10** Question time/Remarks



Programme- Sunday, March 21, 2021

09:00-09:15 **Opening Remarks**
Nikolaos Tzortzakis-Silvana Nicola

09:15-11:00 **Session VI: Biofortification and Biostimulants**
Moderator: Dimitrios Savvas, Agricultural University of Athens, Greece

Invited lecture

L5 09:15-09:45 **Chemical Eustress and Biofortification: Targeted Nutrient Solution Management for Enhancing Quality in Hydroponically Grown Vegetables**
Stefania De Pascale, University of Naples, Italy

Oral Communications

O25 09:45-10:00 **Biostimulants and their role in improving plant nutrition in hydroponic conditions**

Andrea Ertani, University of Turin, Italy

O26 10:00-10:15 **The impact of heated nutrient solution on yield and chemical composition of hydroponically grown 'baby leaf vegetables**

Athanasios Koukounaras, Aristotle University of Thessaloniki, Greece

O27 10:15-10:30 **Design of test and imaging tools to evaluate biostimulant effects on plant roots hydroponically grown**

Rafael Anton-Herrero, Autonomous University of Madrid, Spain

O28 10:30-10:45 **Nutritional value of five new tomato (*Solanum lycopersicum* L.) cultivars in a commercial glasshouse in the Mediterranean area**

Onofrio Davide Palmitessa, University of Bari Aldo Moro, Italy

10:45-11:00 Question time/Remarks

11:00-11:15 Coffee break

11:15-12:00 **Session VII: New Growing Systems**
Moderator: Antonio Ferrante, University of Milan, Italy

Invited lecture

L6 11:15-11:45 **Floating Growing Systems and New Growing Systems® to Grow Leafy Vegetables and Herbs**
Silvana Nicola, University of Turin, Italy

Oral Communications

O29 11:45-12:00 **Assessing the potential of the hydroponic greenhouse cultivation of leek (*Allium porrum*) in gutters**

Robin Van Havermaet, PCG - Vegetable Research Centre, Belgium

12:00-13:30 **Session VIII: Industrial and ISHS WG-Meeting and Closing Ceremony**

Moderators: Nikolaos Tzortzakis, Convener, Silvana Nicola, Co-convener

12:00-12:15 **Young Minds Awards**

12:15-13:10 **ISHS WG- Business meeting**

Moderators: Graeme Smith, Chair – ISHS Working Group – Hydroponics & Aquaponics; Erik Van Os- Wageningen University and Research

13:10-13:30 **Closing ceremony**

Moderator: Stefania De Pascale, ISHS Division – Protected Cultivation & Soilless Culture



Abstract index

Lectures

- | | | |
|----|---|----|
| L1 | The colourful life of plants in indoor farming | 17 |
| | <i>Leo F.M. Marcelis, Michele Butturini, Sander H. van Delden, The Netherlands</i> | |
| L2 | Biological control of root pathogens in soilless cultures | 17 |
| | <i>Monica Höfte, Belgium</i> | |
| L3 | Optimizing plant nutrition in open and closed hydroponic systems | 18 |
| | <i>Dimitrios Savvas, Greece</i> | |
| L4 | Urban agriculture: an emerging sector stimulating research and innovation on soilless culture including hydroponics and aquaponics | 18 |
| | <i>Haissam Jijakli, Belgium</i> | |
| L5 | Chemical eustress and biofortification: Targeted nutrient solution management for enhancing quality in hydroponically grown vegetables | 19 |
| | <i>Stefania De Pascale, Youssef Rouphael, Italy</i> | |
| L6 | Floating Growing Systems and New Growing Systems® to grow leafy vegetables and herbs | 19 |
| | <i>Silvana Nicola, Andrea Ertani, Italy</i> | |

Oral Communications

- | | | |
|-----|--|----|
| O1 | Effect of supplementary light on growth, yield and fruit quality of two tomato cultivars grown in High-Tech glasshouse | 21 |
| | <i>Abdulaziz Alharbi, Omar Babiker, Jouke Campen, Mohamed Ewis Abdelaziz, Feije de Zwart, Wim Voogt, Kees Scheffers, Ilias Tsafaras, Muien Qaryouti, Khalid Al-Assaf, Kingdom of Saudi Arabia</i> | |
| O2 | Microclimate analysis to test the performance of an experimental two-level unit in the hydroponic greenhouse | 21 |
| | <i>Helena Vitoshkin, Mollie Sacks, Vitaly Haslavsky, Israel</i> | |
| O3 | Evolution of soilless culture in Chile | 22 |
| | <i>Gilda Carrasco, Paula Manríquez, Felipe M. Galleguillos, Fernando Fuentes-Peñailillo, Miguel Urrestarazu, Chile</i> | |
| O4 | Peat reduced substrates for vegetable seedlings | 22 |
| | <i>Norbert Laun, Sebastian Weinheimer, Frieder Lutz, Michael Emmel, Nazim Gruda, Germany</i> | |
| O5 | The effects of irrigation frequency on water and heat regimes in different substrates and their mixtures: tomato as a case study | 23 |
| | <i>Asher Bar-Tal, Hadar Heller, Raneen Shawahna, Michal Amichai, Shabtai Cohen, Ofer Guy, Moran Segoli, Markus Tuller, Israel</i> | |
| O6 | Opportunities and challenges of using non-thermal plasma treatments in soilless cultures: experience from greenhouse experiments | 24 |
| | <i>Samantha Cannazzaro, Sara Di Lonardo, Sonia Cacini, Silvia Traversari, Gianluca Burchi, Catello Pane, Francesca Gambineri, Lamberto Cursi, Daniele Massa, Italy</i> | |
| O7 | Closed nutrient solution systems in Portuguese tomato greenhouses | 25 |
| | <i>Raquel Saraiva, António Marques, José Grego, Igor Dias, Maria Lopes, Luís Ferreira, Maria Godinho, Guilherme Martins, Sérgio Ferreira, Sofia Rodrigues, José Firmino, Paulo Maria, Margarida Oliveira, Portugal</i> | |
| O8 | Treatment of biofilm formation in irrigation lines in zero liquid discharge cultivation systems | 26 |
| | <i>Jim Van Ruijven, Ariyati Persijn, Kimberly Learbuch, Anthony Verschoor, The Netherlands</i> | |
| O9 | Survival and transfer of <i>Salmonella</i> Enteritidis in lettuce cultivated in hydroponics as affected by different pH of nutrient solution | 26 |
| | <i>Panayiota Xylia, Antonios Chrysargyris, George Botsaris, Panagiotis Skandamis, Nikolaos Tzortzakis, Cyprus</i> | |
| O10 | Potential accumulation of cleaning products in closed soilless culture systems | 27 |
| | <i>Erik Van Os, Ineke Stijger, Suzanne Breeuwsma, The Netherlands</i> | |

O11	Organic Hydroponics: A U.S. Reality Challenging the Traditional Concept of `Organic` and `Soilless` Cultivation	27
	<i>Francesco Di Gioia, Erin Roskopf, United States of America</i>	
O12	Organic sources of nutrient supply for tomatoes and Asian herbaceous vegetables in soilless culture systems	28
	<i>Michael Böhme, Germany</i>	
O13	Tailor-made hydroponic recipes for the production of high quality medicinal and aromatic plants	29
	<i>Antonios Chrysargyris, Nikolaos Tzortzakis, Cyprus</i>	
O14	Effect of different nitrogen fertilization levels on plant growth performance, yield and 6-gingerol content of ginger (<i>Zingiber officinale</i> Roscoe) cultivated in soilless culture system	29
	<i>Yaseer Suhaimi Mohd, Wan Zaliha Wan Sembok, Malaysia</i>	
O15	Development of a robust nitrate sensor for online measurements	30
	<i>Geert Franken, Jos Balendonck, Erik van Os, Arjan Vroegop, The Netherlands</i>	
O16	Influence of different ammonium and nitrate ratio on yield and quality of rocket	31
	<i>Roberta Bulgari, Giacomo Cocetta, Bhakti Prinsi, Luca Espen, Antonio Ferrante, Italy</i>	
O17	Performance of hydroponic Pak choi (<i>Brassica rapa</i> subsp. <i>chinensis</i>) under elevated sodium conditions	31
	<i>Andrej Svyantek, Zhuoyu Wang, Binu Rana, Ikbal Tatar, Collin Auwarter, Harlene Hatterman-Valenti, United States of America</i>	
O18	Dealing with Na accumulation in soilless grown crops with recirculation of drainwater: a case study with sweet pepper (<i>Capsicum annuum</i>)	32
	<i>Wim Voogt, Andrea Diaz-Ismael, Nina Oud, Romain Leyh, The Netherlands</i>	
O19	Evaluation of lettuce (<i>Lactuca sativa</i>) production under hydroponic system; organic liquid versus mineral nutrient solution	33
	<i>Zienab Ahmed, Amira Askri, Alghazal Alnuaimi, Aysha Altamimi, Mumena Alnaqbi, United Arab Emirates</i>	
O20	Water efficient food production in the north	33
	<i>Siv Lene Skar, Norway</i>	
O21	Utilization of run-off nitrate from recirculating aquaculture systems for hydroponic crop cultivation	34
	<i>Øyvind M. Jakobsen, Mona Schiefloe, Galina Simonsen, Kari J. K. Attramadal, Ann-Iren K. Jost, Norway</i>	
O22	Microorganisms in aquaponics: insights on their functions and the kinetics of their communities' evolution over the course of a full lettuce growth cycle	34
	<i>Mathilde Eck, Iris Szekely, Sébastien Massart, Haïssam M. Jijakli, Belgium</i>	
O23	Microbiome and C supply strategies for the rooting medium of an urban rooftop vegetable farm	35
	<i>Bart Vandecasteele, Sarah Ommeslag, Sabien Windels, Caroline De Tender, Jane Debode, Belgium</i>	
O24	Life Cycle Assessment for the determination of key environmental impact indicators in soilless tomato culture and mitigation potential	35
	<i>Vassilios Litskas, Menelaos Stavrinides, Costas Economakis, Nikolaos Tzortzakis, Cyprus</i>	
O25	Biostimulants and their role in improving plant nutrition in hydroponic conditions	36
	<i>Andrea Ertani, Silvana Nicola, Italy</i>	
O26	The impact of heated nutrient solution on yield and chemical composition of hydroponically grown 'baby leaf vegetable	36
	<i>Filippos Bantis, Panagiotis Karnoutsos, Marios Karagiovanidis, Georgios Ntinis, Athanasios Koukounaras, Greece</i>	
O27	Design of test and imaging tools to evaluate biostimulant effects on plant roots hydroponically grown	37
	<i>Rafael Antón-Herrero, Carlos García-Delgado, Gabriel Antón-Herrero, Begoña Mayans, Raquel Camacho-Arévalo, Enrique Eymar, Spain</i>	
O28	Nutritional value of five new tomato (<i>Solanum lycopersicum</i> L.) cultivars in a commercial glasshouse in the Mediterranean area	37
	<i>Onofrio Davide Palmitessa, Angelo Signore, Sofia Caretto, Miriana Durante, Giovanni Mita, Annalisa Paradiso, Francesco Serio, Pietro Santamaria, Italy</i>	



- O29 Assessing the potential of the hydroponic greenhouse cultivation of leek (*Allium porrum*) in gutters** 38
Robin Van Havermaet, Belgium

Posters

- P1 Optimizing nutrient supply in closed soilless cultivations using the software NUTRISENSE as a decision support system** 40
Dimitrios Savvas, Ioannis Panagiotakis, Stefanos Drakatos, Georgia Ntatsi, Nikolaos Tzortzakis, Wim Voogt, Greece
- P2 Tomatlnov - the affirmation of "Tomate do Oeste"** 41
Raquel Saraiva, António Marques, Maria Godinho, Guilherme Martins, Igor Dias, José Grego, José Firmino, Luís Ferreira, Maria Lopes, Paulo Maria, Sérgio Ferreira, Sofia Rodrigues, Margarida Oliveira, Portugal
- P3 Blue LED light irradiation enhances yield in green beans** 41
Beniamino Leoni, Onofrio Davide Palmitessa, Francesco Serio, Angelo Signore, Pietro Santamaria, Italy
- P4 Brassicaceae genotype background dominates the qualitative and mineral profile of six microgreens species grown in controlled environment** 42
Maria Giordano, Christophe El-Nakhel, Michele Ciriello, Sabrina Nocerino, Marios C. Kyriacou, Stefania De Pascale, Youssef Roupheal, Italy
- P5 Attitudes to technical innovations in production of leafy vegetables in Sweden** 43
Annie Drottberger, Lena Ekelund Axelson, Sara Spendrup, Fredrik Fernqvist, Karl-Johan Bergstrand, Sweden
- P6 Advances in vertical controlled environment horticulture in Latin America: promoting food security** 43
Gilda Carrasco, Leo Lobato Kelly, Victor Avendaño, Jorge Bolaños, Fernando Fuentes-Peñailillo, Chile
- P7 Liquid fertilizer as a potential alternative nutrient solution for strawberry production under greenhouse condition** 44
Zienab Ahmed, Amira Askri, Alghazal Alnuaimi, Aysha Altamimi, Mumena Alnaqbi, United Arab Emirates
- P8 Nutrient release and effect on plant performance of three commercial controlled release fertilizers** 45
Sonia Cacini, Sara Di Lonardo, Luca Incrocci, Daniele Massa, Italy
- P9 Soilless production of rocket (*Diplotaxis tenuifolia*) as affected by low and high input of water and fertilizers** 45
Francesco Fabiano Montesano, Massimiliano D'Imperio, Massimiliano Renna, Angelo Parente, Beniamino Leoni, Francesco Serio, Italy
- P10 Evaluation of different concentrations of selenium in combination with mycorrhiza in hydroponic strawberry cultivation** 46
Omiros Antoniou, Antonios Chrysargyris, Panayiota Xylia, Nikolaos Tzortzakis, Cyprus
- P11 Copper and zinc toxicity-induced variation of growth and mineral elemental composition in hydroponically grown rocket plants** 47
Filio Athinodorou, Antonios Chrysargyris, Panayiota Xylia, Nikolaos Tzortzakis, Cyprus
- P12 Combinational impact of salinity and copper stress on *Mentha spicata*'s growth, physiology and metabolism** 47
Antonios Chrysargyris, Eleftheria Papakyriakou, Spyridon A. Petropoulos, Charilaos Tseniklis, Nikolaos Tzortzakis, Cyprus
- P13 Copper uptake effects on growth and profile of geranium species (*Pelargonium graveolens*) cultivated in hydroponic system** 48
Georgia Fasko, Filio Athinodorou, Rita Maggini, Luca Incrocci, Antonios Chrysargyris, Cyprus
- P14 Effect of the nutrient solution electrical conductivity (EC) on the growth, development and nutrient content of *Viola tricolor* var. hortensis grown in perlite** 48
Antonios Tzionis, Panayiota Xylia, Antonios Chrysargyris, Cyprus



P15	Nutrient status of tomatoes grown in hydroponics during the crop cycle as a factor involved in fruit yield and quality	49
	<i>Gunta Cekstere, Anita Osvalde, Andis Karlsons, Guntars Strauts, Latvia</i>	
P16	Performance of geranium and verbena cultivated hydroponically under salinity and high electrical conductivity levels	49
	<i>Pelopidas Antoniou, Omiros Antoniou, Spyridon A. Petropoulos, Nikolaos Tzortzakis, Cyprus</i>	
P17	Uptake of tetracyclines and sulfonamides in hydroponic cultures of lettuce and carrot	50
	<i>Raquel Camacho-Arévalo, Enrique Eymar, Rafael Anton-Herrero, Begoña Mayans, Carlos Garcia-Delgado, Spain</i>	
P18	Biological nitrogen fixation of grafted common bean plants as affected by the salinity stress and the rootstock/scion combination	51
	<i>Dimitrios Savvas, Vasiliki Vougeleka, Costas Saitanis, Evgenios Agathokleous, Pietro P.M Iannetta, Georgia Ntatsi, Greece</i>	
P19	Microgreens: From Trendy Vegetables to Functional Food and Potential Nutrition Security Resource	52
	<i>Francesco Di Gioia, Spyridon A. Petropoulos, Isabel C.F.R. Ferreira, Erin N. Roskopf, United States of America</i>	
P20	The effect of root perturbation on futile cycling of nitrate and consequences for plant growth	52
	<i>Yifei Zhao, Sander H. van Delden, L.F.M. Marcelis, The Netherlands</i>	
P21	Hydroponic cultivation of the wild edible species <i>Reichardia picroides</i> (L.) Roth	53
	<i>Alberto Pardossi, Rita Maggini, Federico Leoni, Stefano Benvenuti, Luca Incrocci, Italy</i>	
P22	Optimization of the biomass and ingenol accumulation in hydroponics culture of <i>Euphorbia peplus</i>	54
	<i>Haissam Jijakli, Françoise Bafort, Ayoub Bouhadada, Belgium</i>	
P23	Impact of 2-chloroethylphosphonic acid grow regulator on the cannabidiol production of soilless hemp culture	54
	<i>Françoise Bafort, Ayoub Bouhadada, Haissam Jijakli, Belgium</i>	
P24	Examining the potential after-effect of LEDs in the healing stage of grafted watermelon seedlings	55
	<i>Filippos Bantis, Christodoulos Dangitsis, Damianos Kitsonidis, Anastasios Siomos, Athanasios Koukounaras, Greece</i>	
P25	BioEnPro4To: Advanced Indoor and Vertical Farm Models in Circular economy, Innovative solutions for sustainable urban farming	56
	<i>Silvana Nicola, Andrea Ertani, Luisella Celi, Elio Padoan, Maria Martin, Roberta Bulgari, Alice Petrini, Francesco Lenzi, Alessandro Scova, Vander Tumiatti, Italy</i>	
P26	Effect of rootstock and cultivar on the nutrient uptake of tomato	56
	<i>Wim Voogt, Sergino Janga, Johan Steenhuizen, The Netherlands</i>	
P27	Suitability of supernatant of aerobic and anaerobic pikeperch (<i>Sander lucioperca</i> L.) sludge treatments for lettuce (<i>Lactuca sativa</i>) production in hydroponics	57
	<i>Boris Delaide, Edson Panana, Bert Deruyck, Stefan Teerlinck, Peter Bleyaert, Belgium</i>	
P28	A simple system for scoring the suitability of composts, woody materials and biochars for peat, lime and fertilizer replacement	58
	<i>Bart Vandecasteele, Steffi Pot, Ilse Delcour, Karen Vancampenhout, Jane Debode, Belgium</i>	
P29	Effects of biostimulants on <i>Solanum lycopersicum</i> L. Plant growth and pest resistance	58
	<i>Rafael Antón-Herrero, Carlos García-Delgado, Begoña Mayans, Raquel Camacho-Arévalo, Enrique Eymar, Spain</i>	
P30	Effect of salinity on glucosinolate accumulation in different rocket species	59
	<i>Giacomo Cocetta, Marta Guarise, Carla Colombani, Fabio Nocito, Antonio Ferrante, Italy</i>	
P31	Comparison of tissue elemental composition of lettuce grown under aquaponic and hydroponic conditions and in soil	60
	<i>Zala Schmutz, Ivo Kaelin, Florentina Gartmann, Theo H. M. Smits, Ranka Junge, Switzerland</i>	
P32	Determination of Stable Isotope Values in Different Compartments of an Aquaponics System	60
	<i>Julian Hügly, Zala Schmutz, Theo H.M. Smits, Ranka Junge, Carsten J. Schubert, Florentina Gartmann, Emmanuel Frossard, Switzerland</i>	



P33	Influence of pH change on the phosphorus cycle in aquaponics	61
	<i>Florentina Gartmann, Julian Hügly, Zala Schmutz, Ranka Junge, Switzerland</i>	
P34	Effect of seaweed (<i>Ascophyllum nodosum</i>) extract on powdery mildew in soilless strawberry	62
	<i>Aruppillai Suthaparan, Runa Gidske, Eli Ronglan, Norway</i>	
P35	Substrate properties on powdery mildew severity and growth of strawberry plants	62
	<i>Aruppillai Suthaparan, Ida Kristin Hagen, Norway</i>	
P36	Spent mushroom substrates as biofilter to reduce antibiotics (tetracyclines and sulfonamides) from wastewaters used in hydroponic cultures	63
	<i>Raquel Camacho-Arévalo, Enrique Eymar, Alexandra Gómez, Begoña Mayans, Rafael Anton-Herrero, Carlos Garcia-Delgado, Spain</i>	
P37	Technical aspects for producing struvite from wastewater and applications in agriculture	64
	<i>Nomiki Kallikazarou, Loukas Koutsokeras, Georgios Constantinides, Maria G. Antoniou, Cyprus</i>	
P38	Effects of treated and untreated cyanobacterial contaminated water on hydroponically grown crops	64
	<i>Maria G. Antoniou, Miltiadis Samanis, Socratis Fotiou, Mark Hadfield, Antonios Chrysargyris, Nikolaos Tzortzakis, Louis Julien, Christine Edwards, Cyprus</i>	
P39	Agronomic and environmental effectiveness of nutrients recovered from urban wastewater in horticulture	65
	<i>Carmen Biel, Mar Carreras, Rafaela Cáceres, Marc Viñas, Spain</i>	
P40	Agronomic evaluation of struvite produced from livestock waste into growing media	66
	<i>Antonios Chrysargyris, Nomiki I. Kallikazarou, Panayiota Xylia, Filio Athinodorou, Nikolaos Tzortzakis, Maria G. Antoniou, Cyprus</i>	
P41	Sustainable livestock waste management for the production of high value biofertilizers and putative uses in agriculture	66
	<i>Maria G. Antoniou, Nomiki Kallikazarou, Emorfia Constantinide, Loukas Koutsokeras, Georgios Constantinides, Georgia-Elina Zoi, George Armenis, Cyprus</i>	
P42	The effect of nitrogen fertilization rate on growth and physiological parameters of three purslane genotypes grown in a soilless cultivation system	67
	<i>Elina Nastou, Georgios Thalassinou, Nikolaos Polyzos, Vasileios Antoniadis, Spyridon A. Petropoulos, Greece</i>	
P43	Iodine, the newly discovered plant micronutrient. Evidences from science are supported by farmers experience in practice	68
	<i>Katja Hora, Harmen Tjalling Holwerda, Belgium</i>	



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