

2014

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14-17 July 2014, Athens, Greece

Edited by Gregory T. Papanikos

THE ATHENS INSTITUTE FOR EDUCATION AND RESEARCH



Agriculture Abstracts
7th Annual International
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14-17 July 2014, Athens,
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Edited by Gregory T. Papanikos

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Preface

This abstract book includes all the abstracts of the papers presented at the *7th Annual International Symposium on Agriculture, 14-17 July 2014*, organized by the Athens Institute for Education and Research. In total there were 54 papers and over 55 presenters, coming from 21 different countries (Australia, Brazil, Bulgaria, China, Costa Rica, Egypt, Estonia, Germany, Hungary, Iran, Israel, Mauritius, Mexico, Morocco, Poland, Serbia, Slovenia, South Africa, Taiwan, Turkey, USA). The conference was organized into fifteen sessions that included areas such as Food Production and the Environment, Food Society, Sustainability and Climate Change, Biofuel, Biocontrol, Technology and Energy, Animal and Dairy Production and Wildlife Ecology, Ecosystems and Plant Insects, Nutrition and Food Economics, Biotic and Abiotic Stresses and Plant Performance, Plants and Soil and other related fields. As it is the publication policy of the Institute, the papers presented in this conference will be considered for publication in one of the books of ATINER.

The Institute was established in 1995 as an independent academic organization with the mission to become a forum where academics and researchers from all over the world could meet in Athens and exchange ideas on their research and consider the future developments of their fields of study. Our mission is to make ATHENS a place where academics and researchers from all over the world meet to discuss the developments of their discipline and present their work. To serve this purpose, conferences are organized along the lines of well established and well defined scientific disciplines. In addition, interdisciplinary conferences are also organized because they serve the mission statement of the Institute. Since 1995, ATINER has organized more than 150 international conferences and has published over 100 books. Academically, the Institute is organized into four research divisions and nineteen research units. Each research unit organizes at least one annual conference and undertakes various small and large research projects.

I would like to thank all the participants, the members of the organizing and academic committee and most importantly the administration staff of ATINER for putting this conference together.

Gregory T. Papanikos
President

FINAL CONFERENCE PROGRAM
7th Annual International Symposium on Agriculture, 14-17 July 2014,
Athens, Greece

PROGRAM

Conference Venue: Titania Hotel (52 Panepistimiou Avenue)

ORGANIZING AND SCIENTIFIC COMMITTEE

1. Dr. Gregory T. Papanikos, President, ATINER.
2. Dr. George Poulos, Vice-President of Research, ATINER & Emeritus Professor, University of South Africa, South Africa.
3. Dr. Nicholas Pappas, Vice-President of Academic Affairs, ATINER & Professor, Sam Houston University, USA.
4. Dr. Tala Awada, Head, Agriculture Research Unit, ATINER & Professor, University of Nebraska, USA.
5. Dr. Konstantinos Giannakas, Professor, University of Nebraska-Lincoln, USA.
6. Dr. Emie Yiannaka, Associate Professor, University of Nebraska-Lincoln, USA.
7. Dr. John Hayes, Professor, Clemson University, USA.
8. Dr. Salah Er-Raki, Professor, University of Cadi Ayyad, Morocco.
9. Dr. Iakovos Caravanos, Professor, Hunter College of the City University of New York, USA.
10. Dr. Keith Edmister, Professor, North Carolina University, USA.
11. Dr. Salazar Raquel, Professor-Researcher, Universidad Autónoma Chapingo, Mexico.
12. Dr. Amitava Rakshit, Faculty Member, Banaras Hindu University, Varanasi, UP, India.
13. Dr. Salah Mohammed Hassan Afifi, Professor, Assiut University, Egypt.
14. Dr. Alice Merab Kagoda, Associate Professor, Makerere University, Uganda.
15. Dr. Amit Sarin, Associate Professor, Amritsar College of Engineering and Technology, India.
16. Dr. Virginia Sisiopiku, Associate Professor, University of Alabama, USA
17. Ms. Ditika Kopliku, Associate Professor, University of Shkodra Luigj Gurakuqi, Albania.
18. Ms. Anila Mesi-Dizdari, Associate Professor, University of Shkodra Luigj Gurakuqi, Albania.
19. Dr. Reha Onur Azizoglu, Postdoctoral Research Associate, College of Veterinary Medicine, North Carolina State University, USA.
20. Dr. Romana Elzbieta Pawlinska-Chmara, Assistant Professor, Opole University, Poland.
21. Dr. Behzad Sani, Assistance Professor, Islamic Azad University, Iran.
22. Dr. Xiaodong Zhang, Postdoctoral Fellow, University of Texas at Austin, USA.

Administration

Fani Balaska, Stavroula Kiritsi, Eirini Lentzou, Konstantinos Manolidis, Katerina Maraki, Celia Sakka, Konstantinos Spiropoulos & Ioanna Trafali

C O N F E R E N C E P R O G R A M**Monday 14 July 2014****08:00-09:00 Registration****09:00-09:30 Welcome and Opening Remarks**

1. Dr. George Poulos, Vice-President of Research, ATINER & Emeritus Professor, University of South Africa, South Africa.
2. Dr. Gregory T. Papanikos, President, ATINER.

09:30-11:00 Session I (Room A): Food Production and the Environment I

Chair: Nicholas Pappas, Vice-President of Academic Affairs, ATINER & Professor, Sam Houston University, USA.

1. William Johnston, Professor, Washington State University, USA, Richard Johnson, Researcher, Washington State University, USA, Charles Golob, Researcher, Washington State University, USA, Kathleen Dodson, Senior Turfgrass Scientist, Jacklin Seed by Simplot, USA, Matthew Nelson, Agronomist, Grigg Brothers, USA, Gwen Stahnke, Associate Professor, Walla Walla Community College, USA & Elizabeth Guertal, Professor, Auburn University, USA. Kentucky bluegrass Germplasm Evaluation for Turfgrass Quality and Grass Seed Production without Open-Field Burning.
2. Lin Chao-Tian, Associate Professor, Chung Shan Medical University, Taiwan & Deng-Jye Yang, Professor, Chung Shan Medical University, Taiwan. Effect of Harvest Time on Chemical Composition, Antioxidant and Anti-Inflammation for Ethanolic Extracts from *Pleurotus Eryngii* Fruiting Bodies.
3. Juan Martinez-Solis, Assistant Professor, Chapingo Autonomy University, Mexico, Margarita Gisela Pena-Ortega, Researcher, Chapingo Autonomy University, Mexico & Ana Nieves-Flores, Researcher, Chapingo Autonomy University, Mexico. Physiological Quality of Wheat (*Triticum aestivum* L.) Seeds and Fungi Incidence after Treatment with Microwave's oven Radiation.
4. German Mendoza, Member, Autonomy University of Metropolitan, Mexico, Jose Martinez, Member, Autonomy University of Metropolitan, Mexico, Fernando Plata, Member, Autonomy University of Metropolitan, Mexico, Alejandro Lara, Member, Autonomy University of Metropolitan, Mexico, Pedro Hernandez, Member, Autonomy University of Metropolitan, Mexico & Maria Magdalena Crosby, Member, College of Postgraduador, Mexico. Effect of Water Treatment with a Biodisc in Consumption and Lamb Performance.

11:00-12:30 Session II (Room A): Biotic and Abiotic Stresses and Plant Performance I

Chair: Francis Anim, Associate Professor, University of Venda, South Africa

1. Juan Enrique Rodriguez-Perez, Professor, Chapingo Autonomy University, Mexico, Ernestina Lopez-Blancas, Professor, Chapingo Autonomy University, Mexico, Abel de los Santos-Lopez, Professor, Chapingo Autonomy University, Mexico, Maria Teresa Martinez-Damian, Professor, Chapingo Autonomy University, Mexico, Jaime Sahagun-Castellanos, Professor, Chapingo Autonomy University, Mexico, Luis Miguel Rodriguez-

11:00-12:30 Session III (Room B): Food Production and the Environment II

Chair: William Johnston, Professor, Washington State University, USA

1. *A.Z.M. Salem, Professor, Autonomy University of Estado, Mexico, A.E. Kholif, Professor, Autonomy University of Estado, Mexico & M.M.Y. Elghandour, Professor, Autonomy University of Estado, Mexico. Influence of the Fibrolytic Enzymes of Cellulose and Xylanase on in Vitro Gas Production Kinetics of Five Diets of Different Concentrate and Forage Ratios. (Monday, 14 of July, at second session). (Monday 14 of July, Morning Session).

<p>Martinez, Professor, Chapingo Autonomy University, Mexico & Lucas Hernandez-Ibanez, Professor, Chapingo Autonomy University, Mexico. Heterosis and Combining Ability for Yield and Quality Fruit in Tomato.</p> <p>2. <u>Halil Ibrahim Oguz</u>, Associate Professor, Adiyaman University, Turkey, Deniz Eroglu, Researcher, Ege University, Turkey, Cuneyt Uyak, Researcher, Yuzuncu Yil University, Turkey. Adaptation and Characteristics of Dwarf M9 Apple Rootstocks Grafted onto Standard Apple (<i>Malus comminus</i> L.) Cultivars in East Anatolia.</p> <p>3. Chin-Fa Hwang, Associate Professor, Hungkuang University, Taiwan. Antioxidant and Antibacterial Activities of Peptide Fractions from Flaxseed Protein Hydrolyzed By <i>Bacillus Altitudinis</i>.</p>	<p>2. <u>Maria Teresa Martinez Damian</u>, Professor, Autonomus University Chapingo, Mexico, E. Lopez-Blancas, Professor, Autonomus University Chapingo, Mexico, J. Martinez-Solis, Professor, Autonomus University Chapingo, Mexico & Juan E. Rodriguez Perez, Professor, Autonomus University Chapingo, Mexico. Antioxidant Capacity and Enzymatical Activity of Basil 'Nufar' (<i>Ocimum Basilicum</i> L.) in Frigoconservacion.</p> <p>3. <u>Fuat Lule</u>, Lecturer, Agricultural Mechanization and Drying Fruits and Vegetables, Turkey, Garip Yarsi, Assistant Professor, University of Mersin, Turkey, Kemal Zorlu, Assistant Professor, University of Adiyaman, Turkey, Firat Baran, University of Adiyaman, Turkey & Mehmet Arslan, Researcher, Bereket Soil Analysis Laboratory, Turkey. The Evaluation of Adiyaman Soil as Vegetable and Fruit Growing and Mechanization.</p> <p>4. <u>Andrej Mergedus</u>, Ph.D. Student, University of Maribor, Slovenia, Cyril Atung, Junior Scientist, NARI, Papua New Guinea, Birte Komolong, Principal Scientist, NARI, Papua New Guinea, Janja Kristl, Head of the Chemistry, University of Maribor, Slovenia, Anton Ivancic, Professor, University of Maribor, Slovenia & Vincent Lebot, Scientist, CIRAD, Vanuatu. The Content of Starch and Minerals of Papua New Guinea Taro (<i>Colocasia Esculenta</i>) Cultivars.</p>
<p>12:30-14:00 Session IV (Room A): Food, Society, Sustainability and Climate Change I Chair: <u>Lin Chao-Tian</u>, Associate Professor, Chung Shan Medical University, Taiwan</p>	<p>12:30-14:00 Session V (Room B): Biofuel, Biocontrol, Technology and Energy I Chair: <u>Halil Ibrahim Oguz</u>, Associate Professor, Adiyaman University, Turkey</p>
<p>1. Francis Anim, Associate Professor, University of Venda, South Africa. Environmental Protection Differences among Rural Farming Communities in South Africa.</p> <p>2. <u>Lemlem Teklegiorgis Habtemariam</u>, Ph.D. Student, Technische University Munchen, Germany, Getachew Abate Kassa, Researcher, Technische University Munchen, Germany,</p>	<p>1. Aysen Bulancak, Researcher, University of Cukurova, Turkey & Mikail Baylan, Associate Professor, University of Cukurova, Turkey. Enhancing Hatchery Performance in Poultry.</p> <p>2. <u>Dong Xuan Kisne Do Thi</u>, Senior Researcher, DVM, Hungary, Istvan Szalay, Director, DVM, Hungary & Lan Phuong Thieu Ngoc, Ph.D.</p>

Harald Maier, Head, Weihenstephan Branch, Deutscher Wetterdienst, Germany & Alois Heissenhuber, Professor, Technische Universitat Munchen, Germany. Are Ethiopian Subsistence Farmers Ignorant about Climate Change? Perception and Adaptation Strategies.

3. Tania Arellano Alavez, Member, Direccion Tecnica of la DGETA, Mexico, German Mendoza, Member, Autonomy Metropolitana Unidad Xochimilco University, Mexico, Jose Martinez, Member, Autonomy Metropolitana Unidad Xochimilco University, Mexico, Fernando Plata, Member, Autonomy Metropolitana Unidad Xochimilco University, Mexico & Oscar Villareal, Member, Benemerita Autonomy University of Puebla, Mexico. Dietary Overlap between White Tail Deer (*Odocoileus virginianus*) and Others Herbivores at the Mixtec, Puebla, Mexico.
4. Jose Antonio Martinez Garcia, Member, German David Mendoza Martinez, Member, Metropolitana Unidad Xochimilco Autonomy University, Mexico, Pedro Abel Hernandez Garcia, Member, Autonomy University of Estado, Mexico, Fernando X.Plata Perez, Faculty Member, Metropolitana Unidad Xochimilco Autonomy University, Mexico & Agustin Tagle Urrutia, Technical Assistant, National Park Izta-Popo, Mexico. Use Coefficient To Estimated Carrying Capacity Nutritional In Endangered Lagomorphs.
5. Garip Yarsi, University of Mersin, Turkey & Fuat Lule, University of Adiyaman, Turkey. Investigation of the Greenhouse Status in Adiyaman.
6. Zahra Nourmohammadi, Assistant Professor, Islamic Azad University, Iran, Masoud Sheidai, Shahid Beheshti University, Iran, Farah Farahani, Islamic Azad University, Iran & Shokoofeh Fazeli, Shahid Beheshti University, Iran. Morphological, Molecular and Genome Size Analyses of Apple Rootstocks in Different Tissue Culture Media.

Student, Dvm, Hungary. Adaptation of Hungarian Guinea Fowl to Tropical Underprivileged Regions of South-Vietnam.

3. Mehdi Hosseini Farahi, Faculty Member of Islamic Azad University, Yasouj, Science and Research Branch, Yasouj, Iran. The Influence of Different Ratio of Nitrogen Form in Nutrient Solution on the Rate of Photosynthesis in Rose Flower (*Rose hybrid*) cv Dolcvita in Soilless Culture. (Monday 14 of July, evening session).
4. Hanaa H. Abd El Baky, Professor, National Research Centre, Egypt, Gamal S. El Baroty, Cairo University, Egypt. Lipid Productivity and Characterization as a Key for Choosing Spirulina for Biodiesel Production.
5. Seyed Mahyar Mirmajlessi, PhD student, Department of Plant Production and Grassland Husbandry, Institute of Agricultural and Environmental Sciences, Estonia, Evelin Loit, Assistant Professor, Department of Plant Production and Grassland Husbandry, Institute of Agricultural and Environmental Sciences, Estonia, Hossein Ahari Mostafavi, Master Student, Agricultural, Medical and Industrial Research School, Nuclear Science and Technology Research Institute, Iran & Marika Mand, Professor, Department of Plant Protection, Institute of Agricultural and Environmental Sciences, Estonia. A Short Review on Application of Radiation and Genetic Engineering Techniques to Improve Biocontrol Agents Activity against Plant Pathogens.
6. Abdolhossein Aboutalebi Jahromi, Factually Member, Jahrom Branch, Islamic Azad University, Iran. Effect of Rosemary and Indian Clove Essence, Putrescin, Hot Water Treatment and Thiabendazol Fungicide on Post-Harvest Life of Mango (*Mangifera indica* c.v Langra). (Monday 14 of July, evening session).

14:00-15:00 Lunch (details during registration)

15:00-16:30 Session VI (Room A): Animal and Dairy Production and Wildlife Ecology I

Chair: Cezary Sempruch, Assistant Professor, Siedlce University of Natural Sciences and Humanities, Poland

1. Wayner Montero-Carmona, Professor, Technological Institute of Costa Rica, Costa Rica & Victor M. Jimenez, Professor, University of Costa Rica, Costa Rica. Vanilla Protoplasts: Isolation and Electrofusion.
2. Cherki Ghoulam, Professor, Cadi Ayyad University, Morocco, Makoudi B., Professor, Cadi Ayyad University, Morocco, Kabbadj A., Professor, Cadi Ayyad University, Morocco, Mouradi M., Professor, Cadi Ayyad University, Morocco, Farissi M, Professor, Cadi Ayyad University, Morocco & Drevon JJ., UMR Eco & Sol, INRA-SupAgro, Morocco. Effect of Phosphorus Deficiency on Phytase Activity of Faba Bean (*Vicia Faba*)-Rhizobia Symbiosis.
3. Jung-Kai Tseng, Associate Professor, Chung Shan Medical University, Taiwan, Chih-Chieh Hisao, Associate Professor, Chung Shan Medical University, Taiwan & Jyh-Cherng Ju, Associate Professor, Chung Shan Medical University, Taiwan. Differentiation of Mouse Embryonic Stem Cells into Retinal Pigment Epithelial Cells.

16:30-18:00 Session VII (Room A): Agriculture, Ecosystems and Plant Insects

Chair: Wayner Montero-Carmona, Professor, Technological Institute of Costa Rica, Costa Rica

1. Cezary Sempruch, Assistant Professor, Siedlce University of Natural Sciences and Humanities, Poland, Martyna Wilczewska, Student, Siedlce University of Natural Sciences and Humanities, Poland, Bogumil Leszczynski, Professor, Siedlce University of Natural Sciences and Humanities, Poland, Hubert Sytykiewicz, Assistant Professor, Siedlce University of Natural Sciences and Humanities, Poland, Agnieszka Kozak, Ph.D. Student, Siedlce University of Natural Sciences and Humanities, Poland & Marta Chwedczuk, Ph.D. Student, Siedlce University of Natural Sciences and Humanities, Poland. Participation of Amino Acid Decarboxylases in Cereal Responses towards Bird Cherry-Oat Aphid Infestation.
2. Yaghoob Zeraatkish, Faculty Member of Islamic Azad University, Yasouj, Science and Research Branch, Yasouj, Iran & Hanieh Yosefi Motaghaed, Faculty Member of Islamic Azad University, Yasouj, Science and Research Branch, Yasouj, Iran. Studying the Effects of Subsidies Targeting on Agriculture in Iran. (Monday 14 of July, evening session).

18:00-20:00 Session VIII (Room A): Round Table Discussion on *Global Environmental and Anthropogenic Challenges to Agro and Natural Ecosystems*

Chair: Dr. George Poulos, Vice President of Research, ATINER & Emeritus Professor, University of South Africa, South Africa.

1. Dr. Constantine Hadjilambrinos, Associate Professor, University of New Mexico, USA.
2. Dr. Maria Christina Fragkou, Assistant Professor, University of Chile, Chile.
3. Mr. Spiro Adamopoulos, Chief Executive Office, Agricultural Levies Institute of Australia, Australia.
4. Arturo F. Castellanos-Ruelas, Professor and Researcher, Autonomous University of Yucatan, Mexico.
5. Marshaley Baquiano, Assistant Professor, University of the Philippines, Philippines.

21:00-23:00 Greek Night (Details during registration)

Tuesday 15 July 2014

<p>08:30-10:00 Session IX (Room A): Nutrition and Food Economics Chair: <u>Tomas de Jesus Guzman Hernandez</u>, National University, Costa Rica</p>	<p>08:30-10:00 Session X (Room B): Biotic and Abiotic Stresses and Plant Performance II Chair: *Zhang Kefeng, Zhejiang University, China</p>
<ol style="list-style-type: none"> 1. <u>Nalan Gokoglu</u>, Professor, Akdeniz University, Turkey & Ilknur Ucak, Research Assistant, Akdeniz University, Turkey. Effects of Apple Cider Vinegar on Chemical and Sensory Properties of Marinated Fish. 2. <u>Deng-Jye Yang</u>, Professor, Chung Shan Medical University, Taiwan & Chao-Tian Lin, Associate Professor, Chung Shan Medical University, Taiwan. Effect of Harvest Time on Saponins (Furostanol and Spirostanol Glycosides) in Different Organs of Yam (<i>Dioscorea pseudojaponica</i> Yamamoto). 3. <u>Mehmet Gokoglu</u>, Associate Professor, Akdeniz University, Turkey & Yasar Ozvarol, Assistant Professor, Akdeniz University, Turkey. Economically Important Shrimp Species in the Gulf of Antalya. 4. Marcin Zekalo, Assistant, National Institute of Agricultural and Food Economics, Poland. Economic Aspects of Milk Production in Organic and Conventional Specialized Dairy Farms in Poland. 5. <u>Rigoberto Rodriguez Quiros</u>, Executive Director of CEMEDE, National University of Costa Rica, Costa Rica, Wilfrido Paniagua Madrigal, Executive Director, Technological Institute of Costa Rica, Costa Rica, V. Larumbe Galech, Executive Director, Technological Institute of Costa Rica, Costa Rica, T.J. Guzman Hernandez, Executive Director, Technological Institute of Costa Rica, Costa Rica, Freddy Aleman Zeledon, Executive Director, National Agriculture University, Nicaragua, B. Mendieta Araica, Executive Director, National Agriculture University, Nicaragua, Sandra Lovo Jerez, Executive Director, National Agriculture University, Nicaragua, Lilliam de Jesus Lezama Gaitan, Executive 	<ol style="list-style-type: none"> 1. <u>Deniz Eroglu</u>, Professor, Ege University, Turkey, Halil Ibrahim Oguz, Associate Professor, Adiyaman University, Turkey & Fatih Sen, Associate Professor, Ege University, Turkey. Physicochemical Properties of White Mulberry (<i>Morus Alba</i> L.) Genotypes from Southeast Anatolia Region of Turkey. 2. <u>M. R. Garcia-Mateos</u>, Professor, Autonomous University of Chapingo, Mexico, M. Ramirez-Ramos, Professor, Autonomous University of Chapingo, Mexico, C. Ybarra-Moncada, Professor, Autonomous University of Chapingo, Mexico. Corrales-Garcia, Professor, Autonomous University of Chapingo, Mexico & A. M. Castillo-Gonzalez, Professor, Autonomous University of Chapingo, Mexico. Antioxidant Compounds in Eleven Pigmented Varieties of Prickly Pear (<i>Opuntia</i> sp.) in Pre and Postharvest. 3. <u>Claudio de Oliveira Romao</u>, Researcher, Federal University of Bahia, Brazil, Gleidson Giordano Pinto de Carvalho, Researcher, Federal University of Bahia, Brazil, Aureliano Jose Vieira Pires, Researcher, Estadual University of Sudoeste da Bahia, Brazil, Stefanie Alvarenga Santos, Researcher, Federal University of Bahia, Brazil & Manuela Silva Libanio Tosto, Researcher, Federal University of Bahia, Brazil. Chemical Composition of Three Genotypes of Sugar Cane Treated with Calcium Oxide. 4. *<u>Mila Grahovac</u>, Teaching Assistant, University of Novi Sad, Serbia, Jovana Grahovac, Assistant Professor, University of Novi Sad, Serbia, Jelena Dodic, Associate Professor, University of Novi Sad, Serbia, Jelica Balaz, Retired University Professor, University of Novi Sad, Serbia & Ivana Tadijan, Research Assistant, University

<p>Director, National Agriculture University, Nicaragua & R. Larios, Executive Director, National Agriculture University, Nicaragua. Preliminary Results of the Study in the Border Zone of Costa Rica and Nicaragua on Food and Nutrition Security.</p>	<p>of Novi Sad, Serbia. Mode of Antifungal Activity of <i>Streptomyces Hygroscopicus</i> against <i>Colletotrichum</i> SPP.</p>
<p>10:00-11:30 Session XI (Room A): Animal and Dairy Production and Wildlife Ecology II Chair: <u>Deng-Iye Yang</u>, Professor, Chung Shan Medical University, Taiwan</p>	<p>10:00-11:30 Session XII (Room B): Food Production and the Environment III Chair: Sweetia Ramirez, Research-Professor, Chapingo University, Mexico</p>
<ol style="list-style-type: none"> 1. <u>Elena Balacheva</u>, Assistant Professor, Institute of Plant Physiology and Genetics, Bulgaria, Elena Shopova, Assistant Professor, Institute of Plant Physiology and Genetics, Bulgaria & Mariana Radkova, Assistant Professor, AgroBioInstitute, Bulgaria. Do Consumers Fully Benefit From the Richness of Dietary Contribution to Human Health Offered by Tomato. 2. *<u>Zhang Kefeng</u>, Zhejiang University, China, Po Li, Zhejiang University, China & Feiqing Wu, Zhejiang University, China. Numerical Investigation of Optimal Irrigation Rate and Time for the Loam-type Soils. 3. <u>Margarita Gisela Pena-Ortega</u>, Researcher, Chapingo Autonomy University, Mexico, Luis Manuel Serrano-Covarrubias, Researcher, Chapingo Autonomy University, Mexico & Juan Martinez-Solis, Researcher, Chapingo Autonomy University, Mexico. Exploration of Genetic Variability of Bean (<i>Phaseolus Vulgaris</i> L.) Landraces through ISSR Markers. 4. <u>Lan Phuong Thieu Ngoc</u>, Ph.D. Student, Dvm, Hungary, Eva Varadi, Fellow Researcher, Dvm, Hungary, Barbara Vegi, Fellow Researcher, Dvm, Hungary, Krisztina Liptoi, Senior Researcher, Dvm, Hungary & Judit Barna, Senior Researcher, Dvm, Hungary. Comparison between Slow, Programmable Freezing and Fast Freezing Protocol of Hungarian Guinea Fowl Spermatozoa. 	<ol style="list-style-type: none"> 1. *<u>Arturo F. Castellanos-Ruelas</u>, Professor and Researcher, Autonomous University of Yucatan, Mexico, Patricia Perez-A., Former Student, Autonomous University of Yucatan, Mexico, David A. Betancur-Ancona, Professor and Researcher, Autonomous University of Yucatan, Mexico & Luis A. Chel-Guerrero, Professor and Researcher, Autonomous University of Yucatan, Mexico. Metabolizable Energy Value of <i>Canavalia Ensiformis</i>, a Protein Resource for Poultry Production in the Tropics. 2. <u>Yi-Chen Chen</u>, Associate Professor, National Taiwan University, Taiwan, Jen Lin, National Taiwan University, Taiwan, Kou-Tai Yang, National Taiwan University, Taiwan, Cheng-Wei Liu, Ming-Dao University, Taiwan & Ming-Hsu Chang, National Kaohsiung University of Hospitality and Tourism, Taiwan. Lipid-Lowering Effects of Pepsin-Digestion Chicken-Liver Hydrolysates in a High-Fat Dietary Habit. 3. <u>Tomas de Jesus Guzman Hernandez</u>, National University, Costa Rica, Carlos Munoz Ruiz, National University, Costa Rica, V. Larumbe Galech, National University, Costa Rica. "The Local Plant Genetic Resources and Their Integration into Family Farming, Using" Mixed Garden "In Border Communities in Costa Rica".

<p>11:30-13:00 Session XIII (Room A): Food, Society, Sustainability and Climate Change II</p> <p>Chair: *<u>Arturo F. Castellanos-Ruelas</u>, Professor and Researcher, Autonomous University of Yucatan, Mexico</p>	<p>11:30-13:00 Session XIV (Room B): Plants and Soil</p> <p>Chair: <u>Yi-Chen Chen</u>, Associate Professor, National Taiwan University, Taiwan</p>
<ol style="list-style-type: none"> 1. <u>M. Teresa Colinas- Leon</u>, Assistant Professor, Autonomous University of Chapingo, Mexico, <u>Nadia Zenil- Lugo</u>, Assistant Professor, Autonomous University of Chapingo, Mexico, <u>Hector Lozoya-Saldana</u>, Assistant Professor, Autonomous University of Chapingo, Mexico, <u>M. Teresa Martinez-Damian</u>, Assistant Professor, Autonomous University of Chapingo, Mexico & <u>Juan Martinez-Solis</u>, Assistant Professor, Autonomous University of Chapingo, Mexico. Preservative Solutions and Oxidative Stress in Cut Rose (<i>Rosa hybrid L</i>). 2. <u>Spiro Adamopoulos</u>, Chief Executive Office, Agricultural Levies Institute of Australia, Australia. Animal and Plant Disease Incursions: How can Agricultural Industries Contribute to Policy that Balances the Risk and Responsibility? 3. <u>Adam Salifu</u>, Ph.D. Student, University of Western Sydney, Australia. Improving Access to Agricultural Extension Services in Ghana: Do Farmer Based Organizations Make a Difference. 	<ol style="list-style-type: none"> 1. <u>Teodoro Espinosa-Solares</u>, Professor, Chapingo Autonomy University, Mexico, <u>Leidy Laura Cruz -de la Cruz</u>, Student, Chapingo Autonomy University, Mexico, <u>Guadalupe Hernandez-Eugenio</u>, Professor, Chapingo Autonomy University, Mexico, <u>Diana Guerra-Ramirez</u>, Professor, Chapingo Autonomy University, Mexico & <u>Miguel Angel Mendez-Aguilar</u>, Professor, IPN, Mexico. Interaction between Microstructure and Thermodynamic Properties of Cactus Cladode Dried by Microwaves. 2. <u>Sweetia Ramirez</u>, Research-Professor, Chapingo University, Mexico. Postharvest Handling of Maraca (<i>Zingiber Spectabile</i>). 3. <u>Bhanooduth Lalljee</u>, Head of Department, University of Mauritius, Mauritius. Revalorisation of a Sugar Factory Effluent for the Improvement of Soil Biological Properties.(Tuesday 15 of July). 4. <u>Leon Van Rensburg</u>, Professor, University of the Free State, South Africa, <u>Ian Bothma</u>, Agricultural Specialist, University of the Free State, South Africa, <u>Pieter Le Roux</u>, Professor, University of the Free State, South Africa. Spatial Distribution of Hydro-Physical Properties of Crop Fields using Electromagnetic Induction Technology.

13:00-14:00 Lunch (Details during registration)

14:00-15:30 Session XV (Room A): Biofuel, Biocontrol, Technology and Energy II

Chair: Spiro Adamopoulos, Chief Executive Office, Agricultural Levies Institute of Australia, Australia

1. Edward Wilczewski, Assistant Professor, University of Technology and Life Sciences, Poland, Grazyna Harasimowicz-Hermann, Professor, University of Technology and Life Sciences, Poland & Grzegorz Lemanczyk, Assistant Professor, University of Technology and Life Sciences, Poland. Effect of Sowing Technology on Winter Oilseed Rape Density in Autumn and Plant Overwintering.
2. Nonel Thirer, Lecturer, Holon Institute of Technology, Israel & Igor Uchansky, B.Sc. Student, Holon Institute of Technology, Israel. A FPGA based Computer System for a Greenhouse Control.
3. Jaime Sahagun Castellanos, Professor, Chapingo Autonomy University, Mexico & Juan Enrique Rodriguez-Perez, Professor, Chapingo Autonomy University, Mexico. Genetic Stability of Synthetic Varieties Developed with Double-Cross or Three-Way Line Hybrids.

17:30-20:30 Urban Walk (Details during registration)

21:00-22:00 Dinner (Details during registration)

Wednesday 16 July 2014

Cruise: (Details during registration)

Thursday 17 July 2014

Delphi Visit: (Details during registration)

Hanaa H. Abd El Baky
Professor, National Research Centre, Egypt
&
Gamal S. El Baroty
Cairo University, Egypt

Lipid Productivity and Characterization as a Key for Choosing *Spirulina* for Biodiesel Production

Production of biofuel from microalgae is dependent on the biomass production rate and lipid content. The yield of biomass and lipid accumulation is limited by several factors, of which salt stress. In this study, the marine microalgae *Spirulina* was cultivated in modified medium for enhanced biomass production and lipid accumulation. The fatty acid profile and biodiesel properties of *Spirulina* were investigated. The result showed that the maximal biomass and lipid productivity were found to be correlated with increasing salt levels. Moreover, concentrations of salt, Fe⁺ and phosphorus limitation in culture medium were found to have significant effect on fatty acid composition of *Spirulina*. Gamma Linolenic (C18:3, omega-6) and palmitic (C16:0) acids were identified as major fatty acid. The biodiesel produced from their fatty acid were compared with standard EU biodiesel. The quality of biodiesel produced from algal lipid by a transesterification reaction was located between the limit imposed by the European Standards (EU 14214) and ASTM (US D6751). Thus, high quality of biodiesel prepared from *Spirulina* oil, suggested that *Spirulina* could be mass-cultured in outdoor ponds, as promising feedstock for biodiesel production.

Abdolhossein Aboutalebi Jahromi

Factually Member, Jahrom Branch, Islamic Azad University, Iran

**Effect of Rosemary and Indian Clove essence,
Putrescin, Hot Water Treatment and Thiabendazol
Fungicide on Post-Harvest Life of Mango
(*Mangifera indica* c.v Langra)**

In order to evaluate the fungicide effect of medicinal plant essence and comparison their influence to chemical fungicides for rising of post-harvest life of mango (*Mangifera indica* c.v Langra), was performed an experiment in completely randomized design with 14 treatments and 10 replicates. The treatments were consist: control (without treatment), dipping in Putrescin (1, 3 and 6 mmol for 2 min), the essence of Indian Clove and Rosemary (500, 750 and 1000 mg/l) and warm water 54 °C and Thiabendazol fungicide (0.5, 0.75 and 1.0 mg/l for 3-5 min). After operating treatments, the fruits were stored in a refrigerator with 10 °C temperature and 85-90% relative humidity. 30 days after beginning storing, the characters such as weight loss percent, loss firmness percent, increasing vitamin C percent, loss total acid percent, increasing total soluble solid (TSS) percent and increasing pH percent was measured. Result showed that the qualitative and quantitative characteristics of mango c.v Langra influenced by the treatment type. According to the obtained results, the least weight loss percent was observed in Indian Clove 750 mg/l. Treatment type had significant influence on so that the least amount of firmness loss was in Rosemary 500 mg/l. The highest increasing amount of TSS was in hot water treatment and the least in Putrescin 6 mmol. The greatest increasing vitamin C was observed in Rosemary treatment.

Spiro Adamopoulos

Chief Executive Office, Agricultural Levies Institute of Australia,
Australia

**Animal and Plant Disease Incursions: How can
Agricultural Industries Contribute to Policy that
balances the risk and responsibility?**

Sharing the cost of animal and plant disease outbreaks is often left to governments and regional authorities and in extreme cases funded under arrangements that draw on the emergency funds of partnership nations, in much the same way as the EU Veterinary Fund was used after the outbreak of the Foot and Mouth Disease outbreak in the United Kingdom in 2001. Identifying the need to respond to an incursion in the national interest is vital, while developing a policy to deal with a market failure is difficult. This paper will argue that agricultural industries must take responsibility for at least part of the cost of eradication and decontamination of animal or plant disease incursions and that producers should be given a range of tools to enable them to contribute to their on-farm biosecurity.

Cost sharing partnerships are not new as Australia launched their first animal disease cost sharing deed in 2002. Several European member states have compensation arrangements in place for the restocking and refinancing of farmers devastated by disease incursions. Australia has a system of agricultural levies specifically tailored to the sharing of costs with governments in the event of an incursion. Spain has a system of insurance arrangements to compensate farmers while Canada has recently also adopted insurance measures.

A system of tax free savings bonds should also be provided as a tool to enable individual agricultural producers to contribute to the eradication costs of diseases while not penalising farmers who decide to leave the industry. These tax free savings bonds are currently provided by the Australian government for those farmers who find themselves in difficult times, generally drought.

This paper will provide a case for looking at a range of instruments to assist farmers share in the biosecurity of their industry.

Francis Anim

Associate Professor, University of Venda, South Africa

Phineas Khazamula Chauke

University of Venda, South Africa

Environmental Protection Differences among Rural Farming Communities in South Africa

This paper investigated the significant socio-economic characteristics that contributed to differences in attitudes towards environmental degradation among rural farming communities. The population in this study was farmers in rural areas of the Limpopo Province of South Africa. In all, 396 farmers constituted the cohort for the study. Since it was not possible to collect data from all farmers in the province, a simple random sampling method was used in the study. Positive and significant association with environmental degradation was found among farmers with high levels of education, years of farming and household size. It was recommended that since educated farmers in rural farming communities are most likely to understand the detrimental effects of environmental degradation, they should be targeted in research on environmental degradation.

Tania Arellano Alavez

Member, Direccion Tecnica of la DGETA, Mexico

German Mendoza

Member, Metropolitan Autonomous University Xochimilco, Mexico

Jose Martinez

Member, Metropolitan Autonomous University Xochimilco, Mexico

Fernando Plata

Member, Metropolitan Autonomous University Xochimilco, Mexico

&

Oscar Villareal

Member, Autonomous University of Puebla, Mexico

**Dietary Overlap between White Tail Deer
(*Odocoileus Virginianus*) and Others Herbivores at
the Mixtec, Puebla, Mexico**

The objective of this study was to determine the dietary overlap between white-tailed deer (*Odocoileus virginianus*) and other herbivores in a cinegetic ranch in Puebla and to estimate deer population density. Vegetation and excreta were sampled in 15 transects of 300 m long and 6 m wide. A catalog of plants reference and excreta were analyzed by the microhistological method to determine the botanical composition of the diet by species of herbivore. The overlap was assessed with the Pianka index. The population density was 4.5 deer per km². From 65 plant species found, only 16 were consumed by white-tailed deer. The Pianka index among white-tailed deer and lagomorphs was 0.26 and was lowest with horses and cattle (0.04), indicating that there is no competition for feed resources between deer and the rest of the herbivores. The white-tailed deer densities allow hunting harvesting in the unity. The overlap of diets with lagomorphs, horses and cattle is minimal, indicating that other herbivores do not represent a competition for feed competition with the deer.

Elena Balacheva

Assistant Professor, Institute of Plant Physiology and Genetics, Bulgaria

Elena Shopova

Assistant Professor, Institute of Plant Physiology and Genetics, Bulgaria

&

Mariana Radkova

Assistant Professor, AgroBioInstitute, Bulgaria

Do Consumers Fully Benefit From the Richness of Dietary Contribution to Human Health Offered by Tomato

A typical tomato fruit contains intermediate levels of lycopene, β -carotene, ascorbic acid, sugars, but because of the volume of fresh tomato and tomato products that are consumed, tomatoes make important contribution to the dietary intake. The two most important carotenoids in fruits of tomato are lycopene and β -carotene. Therefore, tomato products and their quality can be well characterized by the content of these elements.

Tomato varieties possessing orange color are characterized by up to six times higher β -carotene content in comparison to the red fruited tomato varieties.

The present study was designed to get an idea to what extent Bulgarian consumers profited from the richness of dietary contribution to human health offered by tomato. The study was carried out on: 1. fresh fruits from a number of varieties, available at the open market and supper markets and 2. tomato varieties and genotypes not available on the markets but carrying characters related to important nutrients. The results of our study provided evidence that only red (about 70%) and pink (about 30%) tomatoes were available on the markets. Their lycopene content varied between 3.8 and 6.1 mg%, beta carotene – between 1.4 and 2.7 mg% and lutein varied between 0.35 – 0.42 mg%. At the same time beta carotene content of the orange fruit varieties Carobeta and Pako Orange (group 2) varied between 6.7 mg% and 8.5 mg%. Fruits of the yellow tomato cultivar Zlatista were characterized by high lutein content – 0.71 %. The analysis of the results showed that limiting their consumption to red and pink tomato only, consumers did not fully profit from the nutritive and flavor potential offered by tomato. Hence, some consumers education may be necessary in order to increase the consumption of orange and yellow fruits. On the other hand, breeders could contribute to this topic by developing larger number of varieties displaying diversity in characters related to nutritive and flavor qualities.

Aysen Bulancak

Researcher, University of Cukurova, Turkey

&

Mikail Baylan

Associate Professor, University of Cukurova, Turkey

Enhancing Hatchery Performance in Poultry

Over the last 20 year the poultry industry has shown rapid growth in our country. Hatchery is the first step of the production chain of poultry and is the ring which requires the most investment one. It is very important to supply increased performance in the hatchery for more on the profitability and sustainability of poultry. Chick production in the hatchery is carried out by using information about embryonic development physiology and environmental conditions which broody supplies for its eggs. Along with the development of chick whole body, the immune system can also be determined at hatchery. Incubation conditions are effective on field performance and the mortality rate. Hatchery results (embryo mortality, hatching efficiency, hatchability, etc.) affects the results of the whole chain. It is important analyzed the results and improving hatchery.

Significant effects of incubator temperature, humidity, O₂ levels, CO₂ levels, egg position, turning frequency, lighting, in ovo feeding and embryo follow-up incubation systems on hatchery performance have been proved by studies. At different incubation managements during critical muscle development; such as high temperature, green light or in ovo feeding; developed digestive system capacity, increased growth rate, high feed efficiency, low mortality, an enhanced immune system for enteric antigens, low-skeletal system disorders, advanced muscle and breast meat yield at chicks were obtained at studies.

The aim of this study; is collect information from past to the present about different applied incubation systems at poultry, which are studied, for producing chicks with developed immune system, healthy, stress-resistant, uniform weight and uniform hatchability.

Arturo F. Castellanos-Ruelas

Professor and Researcher, Autonomous University of Yucatan,
Mexico

Patricia Perez-A.

Former student, Autonomous University of Yucatan, Mexico

David A. Betancur-Ancona

Professor and Researcher, Autonomous University of Yucatan,
Mexico

&

Luis A. Chel-Guerrero

Professor and Researcher, Autonomous University of Yucatan,
Mexico

Metabolizable Energy Value of *Canavaliaensiformis*, a Protein Resource for Poultry Production in the Tropics

Legumes are a very important protein resource in tropical areas. Among them, *Canavaliaensiformis*, or (common) jack bean, is a legume which is widely used for animal feeding purposes and human nutrition, especially in Brazil. The most important inconvenience of the use of tropical legumes in animal and human nutrition is the content of anti-nutritional factors, such as of concalectin in *Canavalia*. There are several ways to eliminate toxicity. Various physicochemical treatments are available, but they may be costly or complicated. Separation of the protein fraction can be an alternative method to eliminate the toxic elements. Treatments may have deleterious effects on nutritional value, in particular in energy content, and this should be avoided. Therefore, the objective of this trial was to determine the possible change in true metabolic energy value of *Canavaliaensiformis* either after detoxification treatment or after the separation in its protein concentrates. Beans were grinded and submitted to two different treatments: A) detoxification with salt and acid; B) extraction of its protein concentrate; C) Corn was used as control. Crude protein was estimated in the products obtained. A bioassay was carried out to estimate the true metabolic energy value by means of the forced feeding method using three roosters. The results obtained of the true metabolic energy content, were analyzed using GLM procedure to detect effects of treatment. Results were (Mcal ME/kg dry matter) (n=9): A) 2.999 ± 0.248 ; B) 2.895 ± 0.425 and C) 3.140 ± 0.225 . No differences were observed among treatments ($P > 0.05$). It is concluded that treated *Canavaliaensiformis* does not losses its energy value after submission to detoxification. Protein concentrates of *Canavalia* may be also use in poultry nutrition knowing that is energy value remains unaffected.

Lin Chao-Tian

Associate Professor, Chung Shan Medical University, Taiwan

&

Deng-Jye Yang

Professor, Chung Shan Medical University, Taiwan

Effect of Harvest Time on Chemical Composition, Antioxidant and Anti-Inflammation for Ethanolic Extracts from *Pleurotus Eryngii* Fruiting Bodies

Pleurotus eryngii, a worldwide edible mushroom and being popular in Taiwan, is usually cultivated by means of sawdust medium packing bags through several procedures including culture medium confection, bagging and sterilization, spawn inoculation, fostering mycelia, full growth of mycelia, and inducing fruiting body formation. In this study, *P. eryngii* commercial products harvested at three different times, 10th, 12th and 15th days after inducing the fruiting body formation, were extracted with ethanol individually. Through determination of chemical composition, effectiveness of antioxidation and anti-inflammation of these *P. eryngii* extracts, the optimal harvest time of *P. eryngii* fruiting bodies with higher functional attributes was revealed. Our results showed that ethanolic extract from the sample harvested at the 10th day after inducing the fruiting body formation had the highest levels of phenolic acid and flavonoid than those harvested at the 12th day and 15th day. In addition, extract from the 10th day harvested sample also had the highest contains of tocopherol and carotenoid than the other two day *P. eryngii* extracts. The earlier harvested sample extracts had higher effects for scavenging 2, 2-diphenyl-1-picrylhydrazyl radicals, reducing power, chelating power, and β -carotene bleaching inhibition, as well as down-regulating lipopolysaccharide-stimulated nitric oxide, prostaglandin E₂, inducible nitric oxide synthase, and cyclooxygenase-2 expression in RAW264.7 macrophages. These functional responses were closely related to levels of phytochemical components including phenolic acids, flavonoids, tocopherols and carotenoids. The investigation presented more information for the proper time to harvest *P. Eryngii* fruiting bodies with higher functional activities.

Yi-Chen Chen

Associate Professor, National Taiwan University, Taiwan

Jen Lin

National Taiwan University, Taiwan

Kou-Tai Yang

National Taiwan University, Taiwan

Cheng-Wei Liu

Ming-Dao University, Taiwan

&

Ming-Hsu Chang

National Kaohsiung University of Hospitality and Tourism, Taiwan

Lipid-Lowering Effects of Pepsin-Digestion Chicken-Liver Hydrolysates in a High-Fat Dietary Habit

Functional hydrolysates or peptides, which are inactive within their parent proteins, can be produced by enzymatic hydrolysis during the gastrointestinal transit, fermentation, ripening, and food processing. It has been reported that the protein hydrolysates produced from various protein sources possess some or better beneficial bioactivities other than those found in the parent proteins. Although the chicken liver is a byproduct of broilers, it contains plenty of nutrients. However, due to its undesirable odor, its economic value is therefore lowered. Pepsin hydrolyzation on raw chicken livers significantly elevated contents of hydrophobic amino acids, taurine and carnosine/anserine. Based on our data, chicken-liver-hydrolysates (CLHs) exhibited *in vitro* inhibitory lipase activity and bile-acid binding ability ($p < 0.05$). Forty-eight male hamsters were assigned randomly to the following dietary groups: (1) chow diet; (2) high-fat diet (HFD); (3) HFD and 100 mg CLH/kg BW; (4) HFD and 200 mg CLH/kg BW; (5) HFD and 400 mg CLH/kg BW; (6) HFD and 200 mg carnosine/kg BW. CLHs alleviated ($p < 0.05$) serum oxidative stress and improved ($p < 0.05$) serum lipid profile in high-fat dietary groups; meanwhile, also improved ($p < 0.05$) antioxidant abilities, and decreased ($p < 0.05$) lipid accumulation, oxidative stress, and TNF- α and IL-1 β levels in livers. Those benefits might result from regulations of lipid homeostasis and increased fecal bile-acid outputs ($p < 0.05$). Lipid-homeostasis and antioxidant abilities of CLHs in the high-fat dietary habit were demonstrated and similar to pure carnosine. Moreover, it could be attributed to the synergetic effects of bioactive components (amino acid profile, carnosine/anserine contents, and trace mineral contents) in our CLHs.

M. Teresa Colinas-Leon

Assistant Professor, Autonomous University of Chapingo, Mexico

Nadia Zenil-Lugo

Assistant Professor, Autonomous University of Chapingo, Mexico

Hector Lozoya-Saldana

Assistant Professor, Autonomous University of Chapingo, Mexico

M. Teresa Martinez-Damian

Assistant Professor, Autonomous University of Chapingo, Mexico

&

Juan Martinez-Solis

Assistant Professor, Autonomous University of Chapingo, Mexico

**Preservative Solutions and Oxidative Stress in Cut
Rose (*Rosa Hybrid L.*)**

Tomas de Jesus Guzman Hernandez

National University, Costa Rica

Carlos Munoz Ruiz

National University, Costa Rica

V. Larumbe Galech

National University, Costa Rica

“The Local Plant Genetic Resources and Their Integration into Family Farming, Using” Mixed Garden “In Border Communities in Costa Rica”

The work aims to rescue and conserve local plant genetic resources that have been in the hands of farmers and producers in the northern region of Costa Rica and have been eroded by the use of hybrid and trade seeds or the use of poor quality of traditional seeds.

The working methodology was based on participatory research through field trips where three factors, exploration, diagnosis and classification of plant genetic resources were evaluated.

The work was performed using the following steps; prospecting vital plant genetic resources for food, health and informal trade in the area of influence; diagnosis of major local crops used in family life in the area of influence; classifications of major crops that could become a mixed garden and finally the classification of genetic resources existing in the area according to the rules of morphological descriptors. Food and Agricultural Organization in the International Treaty.

Alternatives have been sought local seed production through "mixed gardens", in order to contribute to food and nutritional security of rural families in the north of Costa Rica near to the border with Nicaragua.

From materials found, it will be working to keep using the method known as Circasitum or "mixed gardens". So far have been prospected and rated more than 64 accessions of different genera and species, which are used systematically by the producers in the area. There were selected farmers and producers who keep these seeds under "in situ".

Some of the genera found are: Beans (*Phaseolus*); vignas (*Vigna unguiculata*), maize (*Zea Mays*), roots and tubers, medicinal plants, sagú (*Canna*); arracache (*Arracacia xanthorrhiza*); Pipián (*Cucurbitapepo* L); among other species.

They pretend to seek a public space conservation of these resources and a private entity that can reproduce quality seeds for distribution and sale in the area.

Claudio de Oliveira Romao

Researcher, Federal University of Bahia, Brazil

Gleidson Giordano Pinto de Carvalho

Researcher, Federal University of Bahia, Brazil

Aureliano Jose Vieira Pires

Researcher, Estadual University of Sudoeste da Bahia, Brazil

Stefanie Alvarenga Santos

Researcher, Federal University of Bahia, Brazil

&

Manuela Silva Libanio Tosto

Researcher, Federal University of Bahia, Brazil

Chemical Composition of Three Genotypes of Sugar Cane Treated with Calcium Oxide

The strategy of this study was to define a variety that improves forage quality by chemical treatment with calcium oxide. We evaluated the chemical composition of three genotypes of cane sugar hydrolyzed at different levels of calcium oxide (CaO) during 24 hours. The experiment was conducted in Minas Gerais State - Brazil. The Genotypes IAC-862480, SP-791011 and CTC-3 were ground and homogenized with CaO at 0, 15, 30 and 45g/kg of fresh material and after 24 hours samples were frozen for later analysis. There was effect of genotype ($P < 0.05$) for dry matter (DM) and cellulose (CEL), where SP-791011 was higher when compared with CTC-3 for both variables. IAC-862480 presented the highest values ($P < 0.05$) for crude protein (CP) and phosphorus (P) when compared the other genotypes. Neutral detergent fiber corrected for ash (cNDF) was affect ($P < 0.05$) by interaction between the factors. All genotypes showed a quadratic behavior of cNDF over CaO levels, with the minimum critical point at 45g/kg of natural matter. IAC-862480 and SP-791011 genotypes did not differ ($P > 0.05$) for acid detergent fiber (ADF), presenting the highest values. However, they differed in relation to CTC-3 ($P < 0.05$). SP-791011 variety showed the lowest values for DM, cNDF and CEL, then presenting a promising condition for use in ruminant nutrition, as these fractions are the slowest ones in ruminal degradation. The addition of CaO in sugar cane genotypes promoted a linear negative behavior in lignin (60, 50, 42 and 37 g/kgDM), non-fibrous carbohydrates (492, 478, 438 and 392 g/kgDM) and total digestible nutrients (697, 657, 606 and 590 g/kgDM), and positive linear behavior for DM (303, 356, 379 and 388 g/kg), ash and Calcium. It was concluded that the level of 45g/kg was effective in reducing cNDF and LIG levels, which demonstrates the efficiency of cell wall hydrolyze in the three genotypes.

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Physicochemical Properties of White Mulberry (*Marus alba* L.) Genotypes from Southeast Anatolia Region of Turkey

In this study, total phenolic content, antioxidant activity and some selected physicochemical properties of six white mulberry (*Marus alba* L.) genotypes harvested from Southeast Anatolia region of Turkey were investigated. Total phenolic content and antioxidant activity of methanol extracts of white mulberry fruits were determined using Folin-Ciocalteu and ferric reducing antioxidant power (FRAP) assays, respectively. Total phenolic content in white mulberry fruits was between 68.3 – 82.3 mg gallic acid equivalent in 100g fresh basis. The antioxidant activities of the genotypes varied between 5.46 - 6.92 μ mol trolox equivalent in g fresh basis. The average colour C* and ho values were 23.0 and 91.8 respectively. The total soluble solids content was 26.3 to 30.5% and moisture content was 64.6 to 81.3%. Fruit weight, length and width of mulberry fruits were between 2.00 – 4.32 g, 17.8 – 26.8 mm and 11.5 – 15.4 mm respectively. The results of this study may aid attempts to improve the cultivation of white mulberry.

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Interaction between Microstructure and Thermodynamic Properties of Cactus Cladode Dried by Microwaves

The fresh cactus cladodes, having a 92.91 ± 0.19 % moisture, were dried applying energy by microwaves. The applied specific power to reach a moisture of 7.72 ± 0.5 % was $75 \text{ kW} \cdot \text{kg}_{\text{db}}^{-1}$ for 310 s and $158 \text{ kW} \cdot \text{kg}_{\text{db}}^{-1}$ for 260 s. The objective was to evaluate the influence of drying power on microstructure of cactus cladode and its relationship with the thermodynamic properties of the food-water interface. Adsorption isotherms were determined at different temperatures (10, 20, 30 and 40 °C) using a gravimetric method, the evaluated water activity range was from 0.461 to 0.988. According to Brunauer classification, sigmoidal curves type III were obtained, indicating weak interactions between the adsorbate and the adsorbent. The Peleg model presented the best fit ($p \leq 0.05$). The net isosteric heat (q_{st}), was calculated using the Clausius-Clapeyron equation. The q_{st} was $7.51 \text{ kJ} \cdot \text{mol}^{-1}$ at the moisture content of $0.05 \text{ kg}_{\text{H}_2\text{O}} \cdot \text{kg}_{\text{db}}^{-1}$, this fact indicates a low energy requirement for removing of water from the material. The micrographs showed an important influence of the applied power by microwaves during drying on the microstructure of the material. When a higher energy was applied a greater damage in the microstructure of the material was observed.

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Antioxidant Compounds in Eleven Pigmented Varieties of Prickly Pear (*Opuntia sp.*) in Pre and Postharvest

Prickly pear is widely distributed, exploited, and commercialized across Mexico, been the first worldwide producer. However, few studies have been conducted in order to determine the nutritional quality of its varieties and its alteration after harvest. The determination of nutritional attributes of this product may generate a better and more efficient agro industrial use, and therefore, it could provide new economical alternatives for the producers. A recent interest worldwide on detection of phytochemicals from this product obeys to the fact that the metabolites contained in this fruit may help to prevent some neurodegenerative diseases, and therefore to keep healthy its consumers. Then, the main objective of this study was to evaluate fluctuations on betacyanins, betaxanthins, phenolic compounds, flavonoids, and vitamin C contents of eleven pigmented varieties of prickly pear. It has been suggested that the get the best nutritional value from this fruit, the consumption period starts ten day before and ends ten days after ripening. The obtained results showed that betacyanins content was higher than betaxanthins levels in purple and red prickly pears varieties, which had been considered of higher nutritional value due to an antioxidant activity. For the majority of the pigmented varieties, the contents of betacyanins, betaxanthins, phenolic compounds, and flavonoids increased after ten days of storage. However, for some varieties a partial loss of vitamin C was found due to storage.

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Effect of Phosphorus Deficiency on Phytase Activity of Faba Bean (*Vicia Faba*)-Rhizobia Symbiosis

Legume-rhizobia symbiosis provides the necessary nitrogen for plant growth and contributes to the improvement of soil nitrogen balance. However, this symbiosis is limited by many environmental constraints such as phosphorus (P) deficiency. Indeed, this major element is massively under insoluble forms in soil since it is strongly associated with aluminum, iron and calcium. Besides, the effect of P deficiency on phosphatases activities, particularly phytases has been widely studied in some N₂-fixing legumes. The current study develops the impact of P deficiency on phytase activity in eight faba bean (*Vicia faba*)-rhizobia symbiosis. The experiment was carried out in a greenhouse on four faba bean varieties (Aguadulce, Alfia, Luz de Otono and Reina Mora) inoculated with two local rhizobia isolated from farmers' fields in Al Haouz region. The P deficiency was applied by adding low KH₂PO₄ concentration (25 μmol plant⁻¹ week⁻¹) to nutrient solution while the control received 125 μmol plant⁻¹ week⁻¹. The plants were harvested at flowering stage and their growth evaluated. P content as well as phytase activities were assessed in nodules. The results showed a significant impact of phosphorus deficiency on plant growth and nodules P content for all of the studied combinations. Also, phytase activity was highly stimulated in nodules under P deficiency. A further analysis of a phytase gene transcription in nodules was performed using RTPCR method showed its localization in the nodule cortex.

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Economically Important Shrimp Species in the Gulf of Antalya

Biological diversity of the Gulf of Antalya is continuously changing due to take place in Eastern Mediterranean (Levantine) ecosystem. This change is being seen on shrimp species caught in this region. This study has been performed using trawl nets (in 25-700 m) and trammels nets (in 1-50 m) in the Gulf of Antalya since 2005. According to our findings *Melicertus kerathurus*, *Marsupenaeus japonicus*, *Penaeus semisulcatus*, *Metapenaeus monoceros*, *Melicertus hathor*, *Farfantepenaeus aztecus*, *Trachypenaeus curvirostris*, *Metapenaeopsis aegyptia*, *Parapenaeus longirostris*, *Aristeus antennatus*, *Aristeomorpha foliacea*, *Plesionika edwardsi*, *Plesionika martia*, *Plesionika narval*, *Plesionika heterocarpus* ve *Pasiphaea multidentata* species have been caught. All species, except *Melicertus kerathurus*, caught in the coast of the Gulf are exotic. *Farfantepenaeus aztecus* among the exotic shrimp species is originated from Atlantic; others are originated from Red Sea.

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Effects of Apple Cider Vinegar on Chemical and Sensory Properties of Marinated Fish

The aim of this study was to use apple cider vinegar in production of marinated fish and investigate its effects on chemical and sensory properties of marinated fish. Anchovy was marinated in two marination solutions (acetic acid and apple cider vinegar). Marinated fish were packed in plastic boxes with sunflower oil and stored at 4°C for 4 weeks. During the storage quality changes of marinated fish were investigated. According to the results, apple vinegar was more effective to retard oxidation. Thiobarbituric acid (TBA) and para-anisidine (p-Av) values of the samples marinated with apple vinegar were lower than in the samples with acetic acid. At the same time other quality parameters trimethylamine (TMA), Total Volatile Bases (TVB-N), pH and sensory analysis findings were lower in the samples with apple vinegar compared to acetic acid. This situation showed that apple vinegar was more effective to protect quality.

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Mode of Antifungal Activity of *Streptomyces Hygroscopicus* against *Colletotrichum* SPP

Primary causal agents of anthracnose of pome fruits are fungal species from the genus *Colletotrichum*. Growing concern about toxicity of synthetic fungicides used in control of these pathogens, as well as resistance development, triggered the need for alternative control measures, such as microbial biopesticides. Species from *Streptomyces* genus proved to be good candidates as potential microbial biopesticides. There is little data on antagonistic activity of *Streptomyces* spp. against *C. acutatum* and *C. gloeosporioides*.

In our previous studies, high antifungal activity of an isolate *S. hygroscopicus* against *C. acutatum* and *C. gloeosporioides* was proven. The aim of this study was to investigate mode of action of this antagonist. One isolate of *C. acutatum* and one of *C. gloeosporioides* were used. The isolates were obtained from rotten apple fruits collected in storages in Vojvodina Province in 2012, and molecularly identified by PCR. Mode of antifungal activity was tested *in vitro* and *in vivo*. In *in vitro* assay, partially modified wells technique was applied. In *in vivo* assay, apple fruits were surface-sterilized and injured by sterile needle making wells (4 mm diameter and 3mm deep). In both assays 72 h old culture liquid of *S. hygroscopicus* containing cells of the microorganism, and culture liquid with removed cells was applied to each well. Cells were removed by centrifugation on an ultracentrifuge at 10,000 G for 10 min at 4 °C. In *in vivo* assay, after application of culture liquid, apple fruits were inoculated by mycelial plugs (Ø 3mm) of seven days old colony of each *Colletotrichum* isolate. Antifungal activity of cultivation liquid with and without cells of *S. hygroscopicus* were compared in both assays.

No significant difference between antifungal activity of two cultivation liquids was registered. Thus, it was concluded that

antifungal activity of *S. hygrosopicus* is based on the production of extracellular metabolites.

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Are Ethiopian Subsistence Farmers Ignorant about Climate Change? Perception and Adaptation Strategies

Farm level adaptation measures are believed to be one of the key instruments to minimize the impact of climate change on agriculture. However; the decision on whether or not to adapt is reported to be primarily affected by the individual's ability to perceive climate change. This research based on survey data from 300 smallholder farmers of Ethiopia, evaluates farmers' understanding of past rainfall and temperature trend, its cause and their anticipation on future climate trend. In addition it identifies ongoing farmers' climate change adaptation strategies. For this purpose, farmers were provided with a list of farming activities and asked if they made any change regarding the specific activity in the past fifteen years, and subsequently questioned why they made that change. The overall result of the survey reveal that the majority of the respondents have observed an increasing temperature and a decreasing rainfall trend. Long term trend analysis of measured rainfall and temperature data from metrological stations in the two districts and a neighboring district support farmers' perception of warming temperature and declining rainfall. The survey data also provided insight on farmers' future climate expectation where a diversity of anticipation were exposed, ranging from wetter and cooler trend to dryer and warmer trend including a number of respondents who were undecided. Analysis of farmers view on the cause of climate change showed deforestation as being widely accepted as the cause. Regarding farmers' climate change adaptation strategy, farmers appeared to make changes on farming activities in the past for various reasons. Changing planting date is found to be the most widely applied modification as a result of climate change.

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The Influence of Different Ratio of Nitrogen Form in Nutrient Solution on the Rate of Photosynthesis in Rose Flower (*Rose hybrid*) cv Dolcvita in Soilless Culture

In a hydroponic system, the effects of different forms of nitrogen (nitrate, ammonium and urea) on rose, cv Dolcvita photosynthetic rates and on its quantitative properties were evaluated. The experiments were conducted in a randomized complete block design with seven ratios of NO₃⁻: NH₄⁺: Urea (100-0-0-, 70-15-15, 50-25-25, 50-0-50, 0-0-100, 50-50-0, 0-100-0, and 0-0-0) with three replications for each treatment. The rooted plants were transferred to pots filled with perlite and cocopeat (50:50). Results showed that increasing the amount of ammonium in nutrient solution reduced the rates of photosynthesis, water use efficiency and also the mesophyll use efficiently. Plants supplied with 100-0-0 and 70-15-15 NO₃⁻: NH₄⁺: Urea ratios, showed the highest photosynthetic rates as compared to other nitrogen ratios.

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Antioxidant and Antibacterial Activities of Peptide Fractions from Flaxseed Protein Hydrolyzed By *Bacillus Altitudinis*

Functional peptides and proteins from foods might be beneficial to human's health. Flaxseed is rich in ω -3 fatty acid, dietary fiber, protein and lignans, and its residue after oil extraction contains 35-40% of protein not widely used yet. In this study, the extracellular protease from strain *Bacillus altitudinis* isolated from the brine tofu was used to hydrolyze flaxseed protein. The hydrolysates were further separated into five fractions according to molecular weight including >10 k, 5-10 k, 3-5 k, 1-3 k and <1 k for analysis of antioxidant activities, antibacterial ability and whitening. Results show that the fraction of 1-3 k peptides exhibits better antioxidant activities on the free radical scavenging ability and reducing power than those of Vit C, Vit E, BHA and other fractions. The fraction, <1 k peptides shows the highest ferrous ions chelating ability and higher inhibition of lipid peroxide compounds than BHA. Besides, <1 k peptides have the best growth inhibition of *Pseudomonas aeruginosa* and *Escherichia coli*. The peptides below 1k exhibit the highest inhibitory activity in vitro of tyrosinase. Conclusion, the fractions from the flaxseed protein hydrolysates by *Bacillus altitudinis* show that there are the potential to be the functional ingredients for human health.

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Kentucky Bluegrass Germplasm Evaluation for Turfgrass Quality and Grass Seed Production Without Open-Field Burning

Open-field burning of Kentucky bluegrass (*Poa pratensis* L.) post-harvest residue, which maintains grass seed yield and stand longevity, has been eliminated in Washington and is restricted in Idaho and Oregon, USA. Our objective was to develop Kentucky bluegrass germplasm that has sustainable seed yield without field burning while maintaining acceptable turfgrass quality. The study consisted of eight PI accessions and two check cultivars ('Kenblue' and 'Midnight'). Accessions were previously selected for both seed yield without field burning and turfgrass quality. In a space-plant nursery at Pullman, WA, several agronomic yield parameters were evaluated over a 2-year period and individual plants were reselected within each accession, or check, with the highest seed weight, highest seeds panicle⁻¹, highest panicle number area⁻¹, and highest seed yield. Turfgrass plots were established in 2006, 2009, and 2010 at Pullman, WA, Auburn, AL, and Puyallup, WA, respectively. Seed production plots (irrigated and non-irrigated) were established at Pullman, WA in 2007. Selection for seed yield components had a variable yield response and seed yield was more dependent on accession. PI 368241, selection panicles area⁻¹, and Kenblue, selection seeds panicle⁻¹, had the best sustainable (four harvests) seed yield without field burning in both non-irrigated and irrigated seed production. Both had fair turfgrass quality. PI 371775, selection seeds panicle⁻¹, had good turfgrass quality while maintaining good seed yield with irrigation. Although Kentucky bluegrass is not recommended as a turfgrass for western Washington, PI 371775 showed

acceptable turfgrass quality at Puyallup, WA. It also may have stress, i.e. heat tolerance, as all five PI 371775 entries placed in the top 10% for turfgrass quality during a 2-year trial at Auburn, AL. These three selections are currently in seed increase and germplasm should be released by 2014.

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Numerical Investigation of Optimal Irrigation Rate and Time for the Loam-type Soils

Agriculture, as the biggest water consumer, uses 70% of fresh water worldwide. With the increase in global population, the area of irrigated land is expected to increase significantly in the future, resulting in an even greater demand for agricultural water use. It is, therefore, critically important to find ways to save water use in agriculture, including the optimisation of irrigation rate and time to avoid irrigated water waste via surface runoff and loss of water to deep percolation. In this study, numerical experiments were carried out for determining optimal irrigation rate and time for crops grown in the loam-type (sandy loam, loam, silt loam and clay loam) soils. Hydrus-1D model was used as the simulation tool. The soil hydraulic property values used in simulations were to be identical as those recommended by the model. The threshold of irrigation, according to FAO56, was assumed to be the soil water content at which a half of readily available water was depleted in the root zone. Results show that no surface runoff occurred for sand loam soil even under great irrigation rates, and the soil wetting front 24h after irrigation increased with the irrigation time in an approximately linear manner. This implies that the entire zone of crops grown in this type of soil with various rooting depths could easily be wetted. However, for other soils the maximum irrigation rate was limited to 12.5 mm/h for loam, 7 mm/h for silt loam and only 4 mm/h for clay loam soils, respectively. Significant runoff occurred in these soils for the irrigation rate exceeding the above mentioned values, and increased with the increase in the irrigation rate. Correspondingly, the maximum soil wetting depth 24h after a 5h irrigation was about 34 cm, 23 cm and 18 cm, indicating that in silt loam and clay loam soils an irrigation could only wet the entire root zone of shallowly rooted crops, while in loam soils it could wet the root zone of crops with a shallow-medium rooting depth.

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Adaptation of Hungarian Guinea Fowl to Tropical Underprivileged Regions of South-Vietnam

In the early 1990s, an in vivo gene bank of 14 old Hungarian indigenous poultry breeds – including local landrace Guinea-fowl – was established by the Institute for Small Animal Research (KÁTKI), the previous name of the Centre for Farm Animal Gene Conservation (HáGK) in Godollo, Hungary. The excellent meat quality, very good ability to adapt to different conditions, resistance, wild and seeking habit with low costs of keeping makes guinea fowl one of the best poultry species for natural and rural production. In 2002, MGE (Association of Hungarian Small Animal Breeders for Gene Conservation) and KÁTKI exported from this gene bank the first guinea fowl populations to Vietnam for adaptation studies, where no breeding stocks of this species were registered. At the beginning, Hungarian guinea fowls were experimentally reared in the Poultry Research Centre (POREC) under the sub-tropical climate of North Vietnam. Following the success of this adaptation experiment, the study aimed to expand the old Hungarian guinea fowl to tropical regions in South Vietnam (Dong Nai and Mekong Delta). Based on the results of this study, it can be concluded that Hungarian guinea fowl can be reared in South Vietnam with success as well. The average growth rate and feed conversion was acceptable and comparable to the performance of local chicken breeds keeping in extensive systems such as family farming. The result achieved in South Vietnam was less favourable than in POREC due to lack of experiences and limited budgets for feeding. However, the successful adaptation of guinea fowls to underprivileged regions of South Vietnam would be the first step for further integrating the Hungarian guinea fowl into the local poultry production and would help the Vietnamese farmers to raise extra income as well as improve their living standard sustainably.

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Revalorisation of a Sugar Factory Effluent for the Improvement of Soil Biological Properties

Agriculture in the island of Mauritius is presently practiced at a heavy cost of agrochemicals. Fertilizers form a major component of farm input, which not only increases production costs, but can also have environmental drawbacks. The Government's Non Sugar Sector Strategic Plan (2003-2007) lays stress on making Mauritian agriculture more environmentally-friendly and sustainable, by reducing agrochemical use. The Plan also proposes organic farming as an alternate form of agriculture, which will on one hand, increase environmental sustainability and on the other, encourage the development of high-value added agri-products for the local, tourist as well as export markets.

Vinasse is an acceptable fertilizer in organic agriculture. It is also in line with Government policy to reduce the present level of chemical fertilizers used in the country. Produced in the ratio of 13:1 vinasse : alcohol during the manufacture of alcohol from sugarcane molasses, vinasse has a high organic matter content which makes it a potential source of biofertiliser or as a substrate for soil organisms. Also, its high content of soluble salts, high BOD and COD, at times high levels of heavy metals, e.g. Pb, and the large volumes of this effluent produced locally can have serious consequences on the environment if not disposed of correctly. Therefore, its use in agriculture can not only help reduce use of chemical fertilizers on one hand, but on the other, also provide an environmentally-friendly method of its disposal.

This paper reports a study on the fertilizer potential of sugarcane vinasse through an investigation of its effects on soil biological properties and fertility, and on the characteristics of maize plants grown thereon.

In this study, 3 rates (100 m³/ha, 200 m³/ha and 400 m³/ha) of undiluted vinasse (density 1.5 × 10³ kg/m³) was incorporated in a Low Humic Latosol (USDA : Tropeptic Haplustox; FAO : Humic Nitosol) in PVC pots containing 4 kg of soil. Control was soil without added vinasse. The experiment was a 4 × 4 Randomised Block Design. The pots were incubated at room temperature for 4 weeks and sown with 3 seeds of maize (*Zea mays*) each. 150 kg/ha of NPK complex fertilizer (18 : 8 : 25) was applied as top dressing to all the treatments including the control. At the end of the growth period (12 weeks) maize plants were uprooted, separated into roots and stovers and analyzed for root biomass, dry matter, and nutrient uptake. Soil from the pots was also

analyzed for respiration rate, total bacterial count, total fungal count, nitrogen fixing bacteria, phosphate solubilising bacteria, earthworm and Collembola counts. Data from 2 years was collected and pooled together.

It was observed that all these soil biological indicators showed positive and significant increases as compared to the control, corroborating studies done by other workers. Tauk et al. (1990) reported increased soil biological activity in red-yellow latosol in Brazil, increased cellulase and amylase activities as well as an increase in filamentous fungi, following vinasse application. Neves et al. (1983) demonstrated an increase in soil bacterial and fungal populations, while Lopes et al. (1986) found that addition of vinasse to soil influenced rhizobial populations but decreased groundnut nodulation. Most of the positive effects on the soil biology are due to the high content of organic matter (> 60%) in the vinasse. The organic matter acts as an easily decomposable substrate and increases microbial population, respiration rate, and leads to higher rate of decomposition of vinasse as well as that of the organic matter in the soil. Hong and Lettinga (1990) reported that about 85% of vinasse was biodegradable. All these processes liberate other plant nutrients, micronutrients as well as growth hormones. The organic matter in the vinasse also increases the water holding capacity of the soil and improves soil structure making it a more friendly environment for earthworms and insects.

It was observed that at the highest rate of application, i.e. 400 m³/ha, the rate of increase in all above parameters decreased. This could be due to the presence of some compounds, e.g. polyphenols, which may have had adverse effects (Tano et al., 2005). This experiment reports data from a 2-year study. The authors consider it desirable to conduct longer term studies using higher doses of vinasse application, in order to study the effects of continued use of vinasse on soil quality and fertility.

This study demonstrated the potential of vinasse to reduce input of chemicals in maize cultivation. Furthermore, this constitutes an environmentally safe and economical way of disposing of this sugar industry waste.

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The Evaluation of Adiyaman Soil as Vegetable and Fruit Growing and Mechanization

In this Study, the physical, chemical, and some nutrient content were determined of Adiyaman soil. In this soil, pH, total salt, organic matter, lime, potassium and phosphorus were analyzed. According to the analysis results, the amount of organic matter is less than 1% in some places, but usually were found between 1-3%. The pH of the soil usually was found neutral and slightly alkaline and the soil structure was found clay and clay loam. According to the results, the Adiyaman soil is suitable for cultivation of vegetables and fruits, and especially in some areas, the organic farming should be encouraged.

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Antioxidant Capacity and Enzymatical Activity of basil 'Nufar' (*Ocimum Basilicum* L.) in Frigoconservacion

The present study aimed to evaluate the effect of cold storage on the antioxidant capacity and enzymatic activity in basil 'Nufar'. To which bunches of this plant, pre-packaged in plastic film, stored at 5, 10 and 20°C for 18 days. Every other day, total phenolics were determined (FET) and antioxidant capacity (CAP) using acetone extract, protein (PRO) and the activity of the enzymes catalase (CAT), superoxide dismutase (SOD), peroxidase (POD) and polyphenol (PFO) from acetone powder. In treatments 5 and 10°C was increased FET content (4,2 mg ·kg⁻¹ PF) to 10 days of storage (DDA), in the treatment of 10°C, showed the highest values CAP at 8 DDA (79,1 mg VCEAC ·g⁻¹ PF) PRO content increased during storage. Cooling increased CAT activity relative to the control, even during storage was decreased. For its part, the activity of SOD significantly decreased in the cooling treatment after 6 DDA (1,6 U mg⁻¹ P). Cooling decreased, compared with the control, the activity of POD and PFO during storage, however, the 10 DDA presented increased activity of these enzymes for the three treatments. Cooling decreased the total phenolic content, antioxidant capacity and POD enzymatic activity, and increased the activity of the PFO, CAT and SOD.

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Use Coefficient to Estimated Carrying Capacity Nutritional In Endangered Lagomorphs

To estimate nutritional carrying capacity (NCC) in wild herbivores normally is used the use coefficient (UC) of 35%, however, this may not be appropriated for all herbivores in especially lagomorphs. Therefore, the objective of this study was to determine if the 35% UC applies to lagomorphs and if can be used as a reliable indicator in the case of *Romerolagus diazi* an endangered lagomorphs known as volcano rabbit. Population density was estimated in four different areas of National Park Izta -Popo, Mexico during five periods of the year was and was compared with NCC estimated with UC of 35% and 50%. Estimations of NCC with UC of 35% underestimated the value whereas 50% UC showed better biological results in three of the four sites where the presence of rabbit was maintained and both coefficients identified the site where rabbits had disappeared. It was concluded that for endangered volcano rabbit, in order to obtain a biological estimation of the nutritional carrying capacity of the habitat, should be used the 50% coefficient of the vegetation utilization.

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Physiological Quality of Wheat (*Triticum aestivum* L.) Seeds and Fungi Incidence after Treatment with Microwave's Oven Radiation

The effect of microwave oven treatment on fungi development on wheat seeds and its effects on physiological seed quality were evaluated in four wheat varieties ('Tlaxcala', 'Batán', 'Rebeca' and 'Triunfo'). The seeds were irradiated by microwave oven over 0, 10, 20 and 30 seconds. A randomized experimental design with four repetitions of 25 seeds each was used. The fungi presence on seeds was evaluated using potato dextrose agar (PDA) media and the physiological seed quality by standard germination test. The lower fungi incidence was associated to 30 seconds of radiation; after this treatment seed showed good germination (73.75 %), low abnormal seedlings (13.50 %) and a low percentage of non-germinated seeds (12.75 %). Radiation for 30 seconds reduced seeds contamination by *Penicillium* and *Alternaria* fungi species. 'Rebeca' variety showed significantly higher seed quality than the rest of the evaluated wheat varieties, therefore suggesting that genotype could be having an important role. The treatment of wheat seeds with microwave oven could be an economical and environmentally friendly alternative to significantly reduce fungi incidence on seeds.

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Effect of Water Treatment with a Biodisc in Consumption and Lamb Performance

The objective of this study was to determine the effects of a BioDisc (BD- Chapingo, patent pending) on water consumption and lamb performance in finishing period. Twenty seven Pelibuey crosses with Canelo x Katadin lambs were used of 26.75 ± 0.97 kg of BW, distributed in a completely randomized design with three treatments, which consisted of potable water (PW), rainwater (RW) and rainwater treated with BioDisc (RW + BD-Chapingo). Lambs were fed with commercial diet containing 13.5% crude protein, 40.56% neutral detergent fiber and 23.81% acid detergent fiber. Water was provided individually *ad libitum*, and consumption was measured daily as well as feed intake. Weight gain and feed conversion were also recorded. The experiment lasted 40 days. There were no effects ($P > 0.05$) in water consumption and feed intake neither in gain or feed conversion. However, numerically there was a trend to reduce in the lambs with group with BioDisc, reducing water consumption in 13.38% and feed intake in 11.46% in comparison to the treatments without device. The results suggest that use of biodisc BD-Chapingo, may be an alternative for saving water and food consumption, without modifying the productive response in finishing lambs.

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**The Content of Starch and Minerals of Papua
New Guinea Taro (*Colocasia Esculenta*)
Cultivars**

Taro (*Colocasia esculenta*) is an important subsistence crop in many parts of Papua New Guinea. It is grown mainly because of its edible corms. The aim of this study was to determine starch and mineral content (K, P, Mg, Ca, Fe, Zn, Mn) of corms of 10 representative, widely grown cultivars originating from different regions of the country. The plant material (i.e., corms) was planted in July 2012 at the National Agriculture Research Institute (NARI), Momase Regional Centre at Bubia near Lae City in Morobe Province. The plants were harvested when they were fully mature. The starch determination was based on the standard enzymatic procedure (Megazyme method). The concentrations of Ca, Mg, and Zn were determined by the flame atomic absorption spectrometry (AAS), whereas the contents of K were determined by the flame emission spectrometry (AES). For the determination of Fe, Mn and Cu the electrothermal atomic absorption (ETAAS) was used. P was analysed by the vanadate-molybdate method. The analysis showed that there was a relatively high concentration of starch in all taro cultivars. Regarding minerals, the cultivars were shown to be high in K, P, Mg and partly in Ca. Reasonably high amounts of Fe were also detected. The concentrations of Zn and Mn were low. The cultivars NT 01, NT 02, C5 353 and BC 737 were superior when taken in consideration all studied parameters. The differences among cultivars were relatively very big. The results can be useful for taro producers breeders.

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A Short Review on Application of Radiation and Genetic Engineering Techniques to Improve Biocontrol Agents Activity against Plant Pathogens

Risks associated with environmental pollution and chemical residues on the leaves and fruits have highlighted the need for more useful and safer alternative control treatments. Biological control is a potential non-chemical means to manage plant pathogens by beneficial microorganisms. Since environmental conditions are subject to change, the biocontrol agent requires genetic improvement for effective performance towards plant pathogen suppression. It is quite obvious that, the application of ionizing radiations (as direct or indirect effects on organisms) and genetic techniques play the greatest role in order to mutation and can improve antimicrobial metabolites and antagonistic potential of biocontrol agents. Genetic improvement can be achieved by protoplast fusion, genetic modification, chemical and physical mutations. Genetically engineering have a main role in increasing anti-microbial metabolites, host colonization ability and endurance in micro-ecosystem for increasing the efficiency and productivity of biological systems. Moreover, physical and chemical mutagens have been applied by many researchers to generate new biotypes. Ultraviolet light (UV), ionizing radiations (Gamma rays, X-rays) and chemicals (as genotoxic agents) can induce modifications in organism's genome. In fact, radiation mutagenesis is proven to be effective in enhancing antimicrobial metabolites production and achieving biological efficiencies in antagonists. In the future, strains bred by mutagenesis will be used as one of the most important research tools for biotechnologists, biochemical engineers, plant pathologists and molecular biologists. In this review, we discuss recent advances in the radiation and molecular genetic techniques with the aim to improve antagonistic potential of microorganisms as it is applied to the suppression of plant diseases.

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Vanilla Protoplasts: Isolation and Electrofusion

The vanilla plant is an orchid mainly commercialized for the production of vanillin. This compound is considered the second greater natural flavoring source in the world. In recent years, price of vanillin has increased considerably, which has generated the necessity of improving the quality of the plant materials. There are few works related to the isolation, fusion and regeneration of protoplasts in vanilla, not allowing to boost the benefits that this technique can generate for crop breeding. This work presents efficient protocols for protoplast isolation and fusion from leaf and protocorm like bodies (PLBs) of vanilla (*Vanilla planifolia* and *Vanilla pompona*) in order to contribute to the genetic improvement of the genus.

A three-week pre-treatment in the dark was standardized before placing the explants in an osmotic solution (0.06 M MES, 0.4 M mannitol, pH 5.7) for one hour at 50 r.p.m. This solution was then replaced with different enzymatic solutions for three hours at 25±1°C and 50 r.p.m. The isolated protoplasts were filtered (320 mesh), centrifuged (100xg for 5 min) and re-suspended in a 0.6 M sucrose solution. Subsequently, a washing solution (50%MS salts with 0.03 M MES and 0.2 M mannitol, pH 5.7) was added to separate protoplasts by flotation-centrifugation. Protoplasts` viability was evaluated with 0.01% Evans blue. Enzymatic solution containing 1% cellulase, 1% pectolyase and 0.5% hemicellulase (pH 5.7) yielded the highest amount of protoplasts from *V. planifolia* leaf explants ($2,9 \times 10^5 \pm 0,7 \times 10^5$ protoplasts/g fresh weight, with a viability of 81%) and from PLBs ($2,8 \times 10^5 \pm 0,7 \times 10^5$ protoplasts/g fresh weight, viability 80%). In *V. pompona*, yields of $2,8 \times 10^5 \pm 0,8 \times 10^5$ protoplasts/g fresh weight from leaf explants (viability 79%) and $2,5 \times 10^5 \pm 0,8 \times 10^5$ protoplasts/g fresh weight from PLBs (viability 79%) were obtained.

For electrofusion, a hypoosmolar solution (Eppendorf[®], HA, AL) alignment and fusion parameters were standardized. The fusion parameters $U_1 = 8 \text{ V}$, 60 s; $A = 170 \text{ V}$, 30 μs , n 3; $U_2 = 8 \text{ V}$, 60 s generated the highest number of fusion events (8.9%). Highest number of microcalli (plating efficiency 9,4%) was observed on media containing 50%MS salts supplemented with MS vitamins, 1% CaCl_2 , 1 mg/L benzyladenine, 1 mg/L 2,4-dichlorophenoxyacetic acid, 0.2 M mannitol, 0.03 M 2-(*N*-morpholino)ethanesulfonic acid, 1 g/L hydrolyzed casein,

20 g/L sucrose, and 6.2 g/L agar as a gelling agent (pH 5.7) in diffuse light (16 hours to 1000 lux).

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Morphological, Molecular and Genome Size Analyses of Apple Rootstocks in Different Tissue Culture Media

The cultivated apple (*Malus domestica*) is important fruit crops cultivated in Iran. Different local and imported apple genotypes are cultivated in Iran, and common apple root stocks M7 and M9 are mostly used root stocks in the country, therefore we tried to develop an efficient proliferation protocol for *in vitro* establishment, multiplication and elongation of the most interesting rootstocks M26 and MM106 in special region of Iran. Also we studied genetic diversity of M7 and M9 tissue culture regenerated plants produced by different treatments by using twenty ISSR markers.

In tissue culture, for optimization of the elongation shoot and proliferation medium, two different macro and micro element formulations were tested: MS and DKW. The 2-isopentenyl adenine (2-ip) and benzyl adenine (BA) are the most frequently used cytokinins in the regeneration systems, but their efficiency depends on genotype and other factors. Phytohormones (2 mg l⁻¹ BA and 2 mg l⁻¹ 2-ip with 0.1 mg l⁻¹ IBA) established for the proliferation of M26 and MM106 apple rootstocks. The both of rootstocks, the MS medium with BA (2 mg l⁻¹) yielded in general the best shoot growth and elongation of branch also, DKW with 2-ip (2 mg l⁻¹) showed the best callus formation and branching. Significantly better growth with the MS medium was also favored by BA as the cytokinin.

In genetic diversity analysis, in total 51 randomly selected plants were studied for the occurrence of somaclonal variation in apple mother plants and tissue culture regenerated plants. Four different treatments were used for tissue culture. Genetic diversity parameters, genetic distance and polymorphism percentage were studied in regenerated plants. Variations in loci frequency and combination were checked by STRUCTURE and the presence of similar loci in the plants

was studied by reticulation NJ tree. The results showed the occurrence of genetic variation among mother plants and tissue culture regenerated plants of each subculture due to somaclonal variation. Significant difference in the genome size among some of the regenerated plants indicates that change in genetic structure of plants during tissue culture is also accompanied with quantitative change in DNA. However, degree of genetic variation differed among apple rootstocks and also among different treatments used.

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Adaptation and Characteristics of Dwarf M9 Apple Rootstocks Grafted onto Standard Apple (*Malus comminus* L.) Cultivars in East Anatolia

Many different apple cultivars are widely are grafted onto Malling Merton rootstocks, of which M9 dwarf rootstocks are the most common. It is widely known that the type of cultivar used has a strong effect on the rootstock. The relationship between cultivar and rootstock is also affected by climate, soil and nutrition conditions. An experimental orchard was established in 2006 and data was taken from 2008 to 2011. In this study performed in Eastern Anatolia, several commercially important cultivars including Breaburn, Fuji, Granny Smith, Golden and Jonegoret were grafted to dwarf M9 rootstock. Several characteristics were analyzed such as blooming time, sapling diameter, productivity (tree/kg), fruit diameter, fruit length, fruit weight, fruit acidity, pH, soluble dry matter and fruit flesh toughness. The best sapling diameters were shown by Golden (45.3 mm) and Granny Smith (39.9 mm) and the highest yields were Mondial Gala (18.06 kg), Granny Smith (16.86 kg) and Fuji (12.9 kg) cultivars. The highest fruit weights were Fuji (220.9 g), Golden (219.1 g) and Mondial Gala (218.4 g). Granny Smith and Fuji cultivars' fruit flesh toughness was relatively higher than other cultivars. Granny Smith's and Golden's fruit sizes were higher than the other cultivars. The highest soluble dry matter was measured in Granny Smith, Fuji and Mondial Gala cultivars. The aim of this study was to determine the best apple cultivar in terms of yield and quality for growth in East Anatolia Region.

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Exploration of Genetic Variability of Bean (*Phaseolus Vulgaris* L.) Landraces through ISSR Markers

Bean is an important crop that has been subjected to a wide-ranging domestication process all across Mexico; therefore, there is an extensive genetic variability available. Consequently, it is a valuable approach to identify useful materials that could enrich genetic diversity of the existing breeding programs. In this study, 30 bean landraces collected at three Mexican provinces were evaluated in order to estimate genetic diversity among them through their genomic fingerprints obtained from ISSR (Inter Simple Sequence Repeat) markers. Ten ISSR primers produced a total of 92 bands, and 82 of them were polymorphic (representing 89 percentage of polymorphism). ISSR-2, LOL8, and LOL10 primers showed high polymorphic information content, and therefore they could be very useful in further genetic studies in this crop. Jaccard's distances between pairs of accessions were used to define five groups according to their molecular diversity. The results obtained from this study proved the existence of important genetic variability among bean landraces collected at distinct geographical locations, and allow establishing the basis for conservation and utilization of evaluated materials for breeding purposes. ISSR molecular markers were able to differentiate genetically bean accessions even though their expected high genetic homogeneity due to its self pollination nature.

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Postharvest Handling of Maraca (*Zingiber Spectabile*)

The effects of temperature, gibberellins, and Cytokinins were evaluated on inflorescences of *Zingiber spectabile* during postharvest. This was done using two temperatures levels (10 and 15 ° C), four levels of gibberellins (GA₃ 00, 50, 100 and 200 mg • L⁻¹) and three levels of Cytokinins (BA 00, 100 and 200 mg • L⁻¹). They were applied as pulse solution for 2 hours while the temperature was applied in dry transport simulation in refrigerated conditions for six days.

Temperature had an effect on the evaluated physical variables. Fresh weight loss was lower and water consumption was greater in inflorescences kept at 10°C. Moreover, chlorophyll content was higher at 10°C, and production of CO₂ was higher at 15°C.

Gibberellins had no significant effects on fresh weight and water consumption while application of 200 mg • L⁻¹ GA₃ resulted in lower chlorophyll content and increased production of CO₂. Compared to the no Cytokinins treatment fresh weight of inflorescences was greater when Cytokinins were applied at 100 and 200 mg • L⁻¹) with no differences in water consumption. Compared to the 00 and 100 mg • L⁻¹ BA the treatment with 200 mg • L⁻¹ BA showed lower chlorophyll content with a greater presence of carotenoids. There were no significant effects of cytokinins application on production of ethylene and CO₂.

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Heterosis and Combining Ability for Yield and Quality Fruit in Tomato

Since the derivation of tomato hybrids requires an adequate selection of progenitors to generate high productivity and quality, the objective of this research was to select materials that could be included in a tomato breeding program. The Best Linear Unbiased Predictors (BLUPS's) of the general (GCA) and specific (SCA) combining ability effects for yield and fruit quality traits associated to 10 F₅ lines were calculated. The evaluation of 10 F₅ lines of tomato with saladet fruit type, and their 45 single crosses (model II of Griffing) was carried out under greenhouse conditions and hydroponics. Five lines showed adequate performance due to favorable GCA effects in fruit yield, pH and vitamin C concentration. Two lines had higher yield and fruit quality than a commercial hybrid (control). One hybrid showed outstanding expression of heterosis with respect to the best parent in yield, pH, titratable acidity and number of fruits per plant; and a second hybrid with outstanding values of SCA in most traits evaluated was also detected. The narrow sense heritability values greater than 20 % were observed only in yield and number of fruits per plant.

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Preliminary Results of the Study in the Border Zone of Costa Rica and Nicaragua on Food and Nutrition Security

Under the Interuniversity Programme to support the transboundary sustainable local economic development Costa Rica-Nicaragua, a project named: "Improving food and nutrition security in border communities by appropriate family farming" was presented and approved. In this project two Costa Rican universities and another from Nicaragua are actively involved.

The project was approved and funded through the agreement PRESANCA II-CSUCA (Regional Programme for Food Security and Nutrition for Central America supported by the European Union and the Central American University Council).

The studied communities in the border area Costa Rica and Nicaragua correspond to Morrito, San Miguelito, Los Chiles and Upala; they show conditions such as low human development, high vulnerability to climate change and fragility in the farming systems.

The methodology corresponds to qualitative research through field visits, interviews, conducting surveys to peasant families, farmers and rural schools and participatory research in the two countries. The work began in November 2012 and will end in September 2014, so the project has been in execution for 14 months now.

One of the most important aspects of the project is to involve the universities of both countries in solving cross-border problems and the suitable spaces for viable solutions for production systems of family farming.

In this context, it has been possible to determine the status of food security, the status of production systems, the level of articulation of these channels with marketing, production and processing practices in family systems.

The first results of the application of this on going research confirms the need for a balanced, fair and equitable agricultural development for these communities in order to achieve food security in an area of extreme fragility of natural resources and environment.

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Genetic Stability of Synthetic Varieties Developed with Double-Cross or Three-Way Line Hybrids

From the development of the theory of the synthetic varieties (SVs) developed with single cross hybrids there is evidence that genetic erosion may occur, increasing inbreeding and thereby causing a decrease in yield. This erosion is due to the mating of heterozygous genotypes, finite progeny number, and randomness of the genetic mechanism. The main objective of this work was to determine the number of non-identical by descent (NIBD) genes lost during the development of the individuals that represent the double-cross (DC) or three-way (TW) line hybrids that in turn will be parents of a SV. The initial lines were assumed to be pure and unrelated and each hybrid derived from them was represented by m individuals, and the mean, variance and number of lost NIBD genes per hybrid were derived. The number of lost NIBD genes of a DC (TW) was the number of NIBD genes in the 4 (3) initial lines minus the mean of NIBD genes in the genotypes of the m individuals that represent the DC (TW). It was found that the losses of a DC and TW are $2(2/2^m)$ and $2/2^m$ NIBD genes, respectively. The size of the losses reflect the number of loss sources (the single crosses), 2 in a DC and 1 in a TW. The largest losses are 2 (DC) and 1 (TW) that occur when $m = 1$. When m is large ($m \geq 12$), the losses and variance decrease importantly.

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Influence of the Fibrolytic Enzymes of Cellulose and Xylanase on In Vitro Gas Production Kinetics of Five Diets of Different Concentrate and Forage Ratios

This study was carried out to assess the effects of different fibrolytic enzymes type (cellulase, xylanase, and their mixture at 1:1, v/v) on *in vitro* ruminal fermentation of five mixed rations with different silage (R) to concentrate (C) ratios (0R:100C, 25R:75C, 50R:50C, 75R:25C, 100R:0C). Samples were incubated using rumen inoculum collected from Brown Swiss cows fed *ad libitum* a total mixed ration of concentrate and alfalfa hay (1:1). Gas production (GP) was recorded at 2, 4, 6, 8, 10, 12, 24, 36, 48 and 72 h of incubation. After 72 h, the incubation was stopped and the pH of incubation fluid was determined, particle filtrate of incubation fluid was used to determine dry matter degradability (DMD), partitioning factor (PF₂₄), gas yield (GY₂₄), *in vitro* organic matter digestibility (OMD), metabolizable energy (ME), and total short chain fatty acids (SCFA). An interaction effects ($P < 0.0001$) were observed between diet type and enzyme type for discrete lag time prior to gas production (L). However, no interactions were observed for the other measured parameters for *in vitro* rumen gas kinetics and rumen fermentation profile. Diet type affected (linear and quadratic effects, $P < 0.0001$) asymptotic gas production (b) and (linear effect, $P = 0.0003$) L . However, *in vitro* GP₂₄ to GP₇₂ were affected (linear effect, $P < 0.0001$) with diets type. It also, affected (linear and quadratic effects, $P < 0.0001$) pH, DMD (quadratic effect, $P < 0.0001$), SCFA (linear effect, $P = 0.0005$), PF₂₄ (linear effect, $P = 0.0011$), GY₂₄ (linear effect, $P = 0.0026$), and MCP (linear effect, $P = 0.0264$). Enzyme types not effected ($P > 0.05$) b , rate of gas production, *in vitro* gas production during the different times. However, enzyme type tended to affect ME ($P = 0.0734$), OMD ($P = 0.0736$), SCFA ($P = 0.0735$). It could be concluded that the most effective diet for *in vitro* GP during different time was 75F:25C with xylanase enzyme.

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Improving Access to Agricultural Extension Services in Ghana: Do Farmer Based Organizations Make a Difference

Recent years have witnessed renewed interest in farmer-based organizations (FBOs) as important local institutions for promoting smallholder agriculture and improving rural livelihoods in Africa. In Ghana, the last decade has witnessed a substantial investment by government and NGOs in the development of FBOs to improve smallholder agriculture. Agriculture in Ghana is predominantly smallholder-based; and smallholder farmers face numerous challenges such as limited access to extension services, credit, farm inputs, and market. Both government and nongovernmental organizations perceive FBOs as suitable local institutions that can overcome some of the challenges of smallholder farmers. In particular, they believe that the establishment of effective FBOs in Ghana will dramatically increase the ability of smallholders to demand agricultural services from service providers; and reduce smallholders' transaction cost of accessing extension services.

Using both qualitative and quantitative data from 240 smallholder farmers and officials from government and nongovernmental organizations collected in Ghana between December 2012 and June 2013, this study explores the extent to which FBOs improves smallholder farmers' access to extension services. Findings from this study suggest that membership to FBOs improves smallholder farmers' access to extension services, although on limited basis. Two main factors explain the limited role of FBOs in improving smallholders' access to extension services. The first relates to the way government and nongovernmental organizations set up FBOs as well as FBOs' capacity to provide or demand extension services. In this vein, the paper argues that FBOs do not only have the capacity to demand extension services but also their members perceive them as avenues to access free inputs and financial support rather than institutions that provide opportunity to generate or demand services. The second factor relates to the number of extension workers available as well as the resources available to them to deliver extension services.

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Participation of Amino Acid Decarboxylases in Cereal Responses towards Bird Cherry-Oat Aphid Infestation

Decarboxylation is one of main pathways of amino acid degradation within plant tissues. Moreover, amino acid decarboxylases are key enzymes in biosynthesis of polyamines and aromatic monoamines that are involved in plant responses to harmful biotic factors. Participation of the amines in plant defense against pathogens is well known, however in case of insect-plant interactions it is not clear. The aim of the studies was quantification of changes in activity of ornithine decarboxylase (ODC), lysine decarboxylase (LDC) and tyrosine decarboxylase (TyDC) in winter wheat and maize cultivars (cvs.) infested by bird cherry-oat aphid (*Rhopalosiphum padi* L.).

Obtained results showed that the aphid feeding induced increase of the amino acid decarboxylase activities in tissues of wheat that was worse settled by the pest (Contessa cv.). The response was started at the first day of the infestation and prolonged to two week in case of LDC, ODC and TyDC. More susceptible Tonacja cv. decreased the changes after one and two weeks (with exception of ODC). Seedlings of less aphid-acceptable maize cv. (Waza) were characterized by strong increase of LDC activity and slight inhibition of ODC while the first week of the infestation. Decreasing tendencies were also proved after two weeks of the aphid feeding in relation to the all studied enzymes. In case of more susceptible maize (Złota Karłowa cv.) *R. padi* feeding

caused an increase in LDC and TyDC activity with simultaneous decrease in ODC activity.

Presented data suggest that the amino acid decarboxylases might be important part of biochemical responses developed by wheat and maize in response to *R. padi* infestation. The changes in the enzyme activities are dependent on genotype of the plant as well as duration of infestation.

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A FPGA based Computer System for a Greenhouse Control

The greenhouses allow a great control over the growing environment of plants. Depending upon the technical specification of a greenhouse, key factors which may be controlled include temperature, levels of light and shade, humidity, ventilation. The computer based systems used for data acquisition and climate control are often costly and problem oriented.

In this paper is presented a cheap and flexible computerized system to control a greenhouse for the growing of cherries tomatoes.

The system collects meteorological data like: light radiation, humidity, temperature, wind speed and by using a special algorithm controls the curtains of the greenhouse, to optimize the climate in the greenhouse. The innovation in this project is the usage of an easy customized hardware & software, using a FPGA technology which is able to create soft core processor (in our case NIOS II processor) in parallel with other logic components, only by software.

The system is implemented on two low cost Altera development boards: DE0 Nano (as Operator Unit) and Cyclone V GX Starter Kit (as Data Acquisition Unit). Thus, the Operator unit controls the curtains motors, and the Data acquisition unit samples all meteorological data and stores them in a SD card. The communication between the units is wireless using transceivers which are very low cost also.

The algorithm can be changed any time (also for research purposes) by connecting an external PC/Laptop connection to the Data acquisition unit, using an USB interface. Also new controls can be added to the Operator unit.

Other advantages of our solution are the portability and an easy customization. Thus, it is possible to replace or to add new sensor/device with digital communication, using the FPGA ability to create/change hardware easily by using IP (intellectual property) cores. Also the IP core should be entirely portable, being able to be inserted into any vendor technology or design methodology.

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Comparison between Slow, Programmable Freezing and Fast Freezing Protocol of Hungarian Guinea Fowl Spermatozoa

Semen cryopreservation is a practical method for banking germplasm from valuable indigenous species which have an increasing risk of extinction. Many scientific publications have described different protocols of avian sperm cryopreservation for both domesticated and non-domesticated avian species, involving cryoprotectant type and packaging method, as well as freezing and thawing rates. In this research, comparative approach was used to evaluate two freezing protocols for guinea fowls: the modified slow programmable method using 10% ethylene glycol (EG), and the newly applied fast freezing method (pellet formation) with 6% dimethylacetamide (DMA). The efficiency of two protocols is measured by both in vitro sperm evaluation assay (determination of sperm concentration and motility, morphological and live/dead sperm analysis) and in vivo sperm evaluation assay (artificial insemination, determination of fertility rate and embryonic death). For fertility determination, candling of incubated eggs was used, extended by checking of the ratio of early embryonic mortality. In vitro qualification showed that the survival rate of live and intact spermatozoa was significantly higher after pelletation than after slow protocol (28.59% vs 23.53%, $p=0.022$, Mann-Whitney U test). In vivo qualification showed that artificial insemination of frozen-thawed semen yielded 50.2% fertility rate with the pellet, while only 25.5% with the slow programmable method (while it was 84.8% in control, $p=0.027$, Kruskal-Wallis ANOVA test). The simple in vitro examinations used in this research were not able to detect injuries which caused embryonic death during freezing procedure, therefore, despite the seemingly acceptable sperm surviving rate, the ratio of eggs containing a normal embryo in case of slow, programmable frozen-thawed semen artificial insemination was significantly lower than in

case of fresh semen artificial insemination (5.88% and 70.46%, while it was 28.37% in case of pellets, $p=0.038$, Kruskal Wallis ANOVA test).

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Differentiation of Mouse Embryonic Stem Cells into Retinal Pigment Epithelial Cells

Age-related macular degeneration (ARMD) is one of the most common cause of vision loss among the elderly. Currently, there is no effective way to cure and repair the damaged retina in clinical. Pluripotent embryonic stem cells (ES cells) can differentiate into all cell lineages of an individual. The U.S. Food and Drug Administration approved that retinal pigment epithelium (RPE)-derived from ES cells can be the source for cell transplantation. The objective of this study is to induce mouse ES cells to differentiate into RPE by treatments of defined factors and/or RPE conditioned medium. It is likely that mouse ES cells can be induced to differentiate into hexagonal RPE cells using treatments. Furthermore, Pax6 gene expressions of retina precursor cells and pigment synthesis (Mitf) were all observed on 3 or 9 days after differentiation. The gene expressions of tight junction protein ZO-1 and visual cycle protein (RPE65) of differentiated mES cells were detected during days 9 and 24. In addition, protein expressions of Mitf, RPE65 and ZO-1 were observed by immunocytochemical staining and western blotting. In conclusion, we show that mouse ES cells can be successfully induced by two methods for RPE differentiation and provide the strategy of RPE differentiation in other species or become the source of cell therapy in the future.

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Spatial Distribution of Hydro-Physical Properties of Crop Fields using Electromagnetic Induction Technology

There is a growing world interest in spatial information related to the hydro-physical properties of crop fields. Electromagnetic induction technology, such as the EM38 which measures apparent electrical conductivity (ECa) of soils, is central in measuring such phenomenon. Researchers have shown the cost-benefit advantage of using these instruments as an alternative to conventional grid sampling and spatial analysis of salinity in crop lands. Despite this advantage the instruments are not widely used in South Africa. This paper explores the ability of the EM38 to indirectly measure the spatial distribution of hydro-physical properties, such as clay percentage, plant available water capacity and soil wetness. The experiment was conducted in a 55 ha crop field near Bloemfontein, South Africa. The EM38 was drawn in a sled behind a quad bike at a speed of approximately 5 km h⁻¹. All measurements were geo-referenced. A detail soil survey was conducted on the field using a mobile hydraulic core sampler. Samples were divided into 300 mm intervals for laboratory analyses. Seventy five neutron excess tubes were installed on a grid basis over the field and volumetric water content was measured in 300 mm intervals up to 900 mm depth. Significant relationships between ECa measurements and clay plus silt content were obtained, which made it possible to estimate the spatial distribution thereof. These relationships were further used to estimate the profile available water capacity and its distribution over the crop field. A good relationship ($r^2 = 0.7$) between ECa and soil water content for the total profile was obtained. This made it possible to estimate soil wetness from the recorded EM readings spatially in the crop field. Soil wetness maps are of great importance to improve management decisions regarding planting time, plant population and fertilizer application rates in dryland agriculture.

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Effect of Sowing Technology on Winter Oilseed Rape Density in Autumn and Plant Overwintering

Winter conditions that occur in north Europe every few years favor winter rape freezing. Therefore optimization of cultivation technology is necessary, ensuring better plant overwintering. Sowing methods tested in this study may support maintaining snow cover on rape plantations and thus reduce damage caused by frost. Field study was conducted in 2011-2014 at the Research Station near Bydgoszcz. Strict, two-factorial field experiments were conducted in Alfisol formed from heavy loamy sand. Winter rape 'Californium' was sown from 25 August - 03 September. The aim of this study was to evaluate the effect of winter rape sowing method on plant overwintering. Three methods were tested (factor I): A - traditional sowing with a drill (Control); B - sowing in 6-8 cm deep furrows with a drill, according to patent PL215714; C - furrow sowing, directly in stubble (seeder with disk coulters). These methods were assessed in 5 variants of sowing density (factor II): 40, 60, 80, 100 and 120 plants·m⁻².

Sowing method had no significant effect on the mean rape density before winter. Plants from furrow sowing formed thicker root necks than in traditional sowing. Plants obtained from sowing directly in stubble were worst developed before winter. They had the thinnest root necks and the fewest leaves in rosettes. In the first year (2011/2012) with frosty winter (minimal temperature -22°C) the number of plants from furrow sowing in spring was significantly higher than those sown with traditional method. In the second year, with mild winter (minimal temperature -13.5°C), better effects were obtained using traditional and direct sowings. Effect of sowing method on rape overwintering depended on sowing density. After sowing of 40, 100 and 120 seeds per m² the plants obtained from direct sowing overwintered best. At 60 seeds per m² plants from furrow sowing overwintered best, and those from traditional sowing significantly worse.

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Effect of Harvest Time on Saponins (Furostanol and Spirostanol Glycosides) in Different Organs of Yam (*Dioscorea Pseudojaponica* Yamamoto)

Steroidal saponins including furostanol and spirostanol glycosides are the important bioactive compounds in yams. In the study, the content of individual saponin in different organs of yam (*Dioscorea pseudojaponica* Yamamoto) harvested from November (2012) to March of the next year (2013) (the harvest season) were determined by high performance liquid chromatography (HPLC). Results showed that total saponin levels in yam organs (tuber cortex, tuber flesh, leaf and vine) except rhizophor harvested at various time were in the order: January > December > February > November > March. Saponin contents in rhizophor gathered in December were higher than those obtained in January. The monthly mean temperatures in the cultivated area (Keelung City, Taiwan) in November 2012, December 2012, January 2013, February 2013 and March 2013 were 21.1, 17.7, 16.3, 17.4 and 18.7 °C, respectively. The saponin contents in yam seem to increase with the reduced temperature (from November 2012 to January 2013) and then decrease with the raised temperature (from January 2013 to March 2013). Yam gathered at the lowest temperature (January 2013) had the highest saponin content. The highest total amounts of saponins among various organs were in the order: tuber cortex (619.79 µg/g dw) > tuber flesh (247.84 µg/g dw) > rhizophor (32.19 µg /g dw) > leaf (26.57 µg/g dw) > vine (25.06 µg/g dw). These results could provide yam saponin information, which could be used as a reference for yam exploitation.

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Investigation of the Greenhouse Status in Adiyaman

Adiyaman is in Southeastern Anatolia. After the Ataturk Dam, the climate was temperate and began to increase diversity of vegetables and fruits. Greenhouse area is about 140 acres in Adiyaman. 1315 tons cucumber, 148 tons tomato and 133 tons pepper are produced. Especially, the soilless culture has increased by using the thermal hot water for heating of greenhouses in Kahta. However, the greenhouse farmers are inexperienced, and in particular the control of diseases and pests were found insufficient.

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Economic Aspects of Milk Production in Organic and Conventional Specialized Dairy Farms in Poland

In dairy sector in Poland processes of concentration lead to lower unit costs of production and to increase profitability and competitiveness of milk production. A large part of market-oriented dairy farms still maintain a small herd of dairy cattle and this often leads farmers to keep milk production in a more extensive way. This may result in a lower milk yielding, but allows for a reduction in direct costs of production. In this case, it may be justified to participate in the system of organic farming, furthermore there is still possibility of additional financial support.

The purpose of this article is to reflect the economic situation of organic milk production and its profitability as well as an attempt to refer to results obtained in conventional dairy farms. Accounting data for 'dairy cows' activity were collected in 2012 and processed according to the rules of the Agricultural Products Data Collection System (AGROKOSZTY). Surveyed farms (organic and conventional) were selected from a representative sample of Polish FADN. Under the AGROKOSZTY system, the methodology used for calculating the gross margin was consistent with the EU rules [Augustynska et al., 2000]. The calculation of gross margin gives a full insight on actual direct costs and helps to compare the competitiveness of milk production carried out on organic farms. The income from 'dairy cows' activity account is based on the Polish FADN information collected from the same farm.

The income from milk production in the surveyed organic farms largely depended on lower total costs, but also was supported by higher subsidies than in conventional farms. The results indicate that total cost of production were lower by 36.7% with respect to conventional farms. However, the profitability of milk production on organic farms was at a lower level due to the lower value of production by 42.3%.

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Studying the Effects of Subsidies Targeting on Agriculture in Iran

Studies indicate that subsidies generate little of the total share of agriculture sector subsidies and have better compliance with government priorities, increasing the share of the production of allocated subsidies increase their support of agricultural production. According to the plan being targeted, potential consequences of making the project impact on agriculture were very important and they are discussed in this study using the VAR model. Regarding results cannot expect by gradual elimination of subsidies in this section, the major variables including agricultural products price index, value-added agriculture and other parameters have large and negative swings so it is suggested that subsidies of this part modified in the form of gradual and smooth plan.