



**The 11<sup>th</sup> Dahlia Greidinger Memorial Symposium  
2013**

**Advanced methods for investigating nutrient  
dynamics in soil and ecosystems**

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**Organized and supported by:  
The Dahlia Greidinger Memorial Fund**

**and**

**BARD, The United States - Israel  
Bi-national Agricultural Research and Development Fund**



**4-7 March, 2013  
Technion-IIT, Haifa, Israel**

***Program***



# The 11<sup>th</sup> Dahlia Greidinger Memorial Symposium 2013

**Sunday, March 3<sup>rd</sup>**

**19:30-21:00 Reception – Nof Hotel**

International participants, Greidinger family, organizing committee and associates, ICL representatives; (*Participants staying at Hotel Marom will be picked up at 19:15*).

**Monday, March 4<sup>th</sup>**

***Rabin Auditorium – Civil Env. Eng. Technion-IIT***

**8:00-9:00**      **Registration**

**9:00-9:40**      **Opening session**

Prof. Avi Shaviv, *Technion- IIT*

Prof. Oded Shmueli Executive Vice President for R&D, *Technion- IIT*

Prof. Yoram Kapulnik - ARO Director - Ministry of agriculture & Rural Development

Greidinger Family representative

**Session 1**

**Global Aspects of Food Security Soils and Sustainability**

**Chaired by Yoram Kapulnik**

**9:40-10:10**      Achim Dobermann, *IRRI*, Philippines  
What will future food systems look like?

**10:10-10:40**      Hillel Magen, *IPI*, Switzerland  
Future potash and fertilizer consumption to sustain agricultural production:  
possible trends and characteristics

**10:40-11:00**      Yoram Kapulnik, *ARO, The Volcani Center*, Israel  
Addressing global food security through agricultural research and development

**11:00-11:20**      **Coffee Break**



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## Session 1 continued

### Approaches for better understating nutrient processes in terrestrial ecosystems - Overviews

Chaired by **Avi Shaviv**

- 11:20-11:50** Christoph Müller, *Justus-Liebig University Giessen, Germany*  
Advances in understanding nitrogen transformations in terrestrial ecosystems
- 11:50-12:20** David Myrold, *Oregon State University, USA*  
The potential of metagenomic approaches for understanding nutrient cycling in soils
- 12:20-12:30** **Discussion**
- 12:30-13:30** **Lunch**

## Session 2

### Advanced tools to investigate N processes in soil

Chaired by **Christoph Müller**

- 13:30-14:00** Tim Clough, *Lincoln University, New Zealand*  
Combining measurements of soil physics, chemistry and microbiology with stable isotopes to improve understanding of nitrogen cycling
- 14:00-14:20** Changwen Du, *Institute of Soil Sciences, China*  
In situ measurement of ammonia content in soil headspace under different nitrogen input pattern using mid-infrared photoacoustic spectroscopy
- 14:20-14:40** Michael Castellano, *Iowa State University, USA*  
Linking soil nitrogen mineralization and retention to soil organic matter stabilization mechanisms
- 14:40-15:00** Yael Dubowski, *Technion, Israel*  
Use of FTIR for detection of isotopically labeled N<sub>2</sub>O emitted from soil
- 15:00-15:20** **Coffee Break**

## Session 3

### Micro sensors for investigating soil processes

Chaired by **Tim Clough**

- 15:20-15:50** Torgny Näsholm, *Swedish Agricultural University, Sweden*  
In situ measurements of diffusion and mass flow of nitrogen compounds in forest soils using microdialysis



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- 15:50-16:10** Petr Baldrian, *Academy of Sciences of the Czech Republic, Czech Republic*  
Enzyme activity measurements at various spatial scales: from landscape level to the microscale
- 16:10-16:30** Shmulik Friedman, *ARO, The Volcani Center, Israel*  
Determining the adsorption energies of ionic nutrients on soil particles by Wien effect measurements in colloidal suspensions
- 16:30-16:50** Raphael Linker, *Technion, Israel*  
Potential and limitations of mid-IR spectroscopy for studying soil nitrogen processes
- 16:50-17:20** **Discussion**
- 17:30 Shuttle to Hotels and Train station**

## Tuesday, March 5<sup>th</sup>

**8:30-9:00** Registration

### Session 4

#### Microbial Effects on Nitrogen Cycling

**Chaired by Jennifer Pett-Ridge**

- 9:00-9:30** Peter Bottomley, *Oregon State University, USA*  
Determining the relative contributions of Thaumarchaea and Bacteria to soil ammonia oxidation and its impact on N cycling
- 9:30-10:00** Nicol Graeme, *Aberdeen University, UK*  
Determining the contribution of Archaea to nitrification in acidic soils
- 10:00-10:20** Sharon Avrahami, *Ruppin Academic Center, Israel*  
The response of ammonia oxidizing bacteria to change in environmental conditions
- 10:20-10:40** Eddie Cytryn, *ARO, The Volcani Center, Israel*  
Impact of short-term acidification on nitrification and nitrifying bacterial community dynamics in soilless cultivation media
- 10:40-11:00** **Discussion**
- 11:00-11:20** **Coffee break and Posters**



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- 11:00-13:00**      **Poster session (Grand Water Research Inst. Auditorium)**  
Coordinators/Referees: Christoph Müller, Eddie Cytryn, Alon Angert
- 13:00 -13:50**      **Lunch and poster session continued**
- 13:50-14:00**      **Announcing – Winners of Best Poster Prize**

## Session 5

### Factors Affecting Soil Microbial Activity

**Chaired by Peter Bottomley**

- 14:00-14:30**      Dani Or, *ETH-Zurich*, Switzerland  
Pore-scale hydrological controls of microbial life in soil
- 14:30-15:00**      Tom Schmidt, *Michigan State University*, USA  
Microbial communities selected by agricultural management and the associated flux of greenhouse gases
- 15:00-15:30**      Dror Minz, *ARO, The Volcani Center*, Israel  
Studying anthropogenic impacts on soil microbiology - the case of irrigation with treated wastewater
- 15:30-15:50**      **Discussion**
- 16:00 - Shuttle to Hotels and Train station**
- 19:30-21:00**      **Reception at the Greidinger Family Residence** (International participants, organizing committee and colleagues, ICL representatives)

## Wednesday, March 6<sup>th</sup>

- 8:30-9:00**      **Registration**

## Session 6

### Tools to Investigate Phosphorus Reactions in Soils

**Chaired by William Horwath**

- 9:00-9:30**      Barbara Cade-Menun, *Agriculture and Agri-Food*, Canada  
Phosphorus forms and cycling with <sup>31</sup>P-NMR spectroscopy



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- 9:30-9:50** Dalel Abdi, *Université Laval*, Canada  
Phosphorus forms in the soil profile determined by <sup>31</sup>P-NMR spectroscopy influenced by tillage practices
- 9:50-10:10** Iris Zohar, *Technion*, Israel  
<sup>31</sup>P-NMR study of phosphorus transformations: from wastewater reclamation to irrigated soil distinct fractions
- 10:10-10:30** Federica Tamburini, *ETH-Zurich*, Switzerland  
Natural variability of oxygen isotopes in soil phosphate: a tracer for unraveling the soil P cycling
- 10:30:11:00** **Coffee break**

## Session 6 continued

### Tools to Investigate Phosphorus Reactions in Soils

Chaired by **Will Horwath**

- 11:00-11:30** Alon Angert, *Hebrew University of Jerusalem*, Israel  
The processes that control the soil phosphate stable oxygen isotopes across rainfall and bedrock gradients
- 11:30-11:50** Michael Krom, *Haifa University*, Israel  
Bacterially mediated removal of P in a non-polluting intensive mariculture system
- 11:50-12:20** **Discussion**
- 12:20-13:30** **Lunch**

## Session 7

### Micro and Nano Systems to Investigate Biogeochemical Processes

Chaired by **David Myrold**

- 13:30-14:00** Jennifer Pett-Ridge, *LLNL*, USA  
Measuring the microbial niche: NanoSIMS and STXM analysis of carbon and nitrogen flows in soil
- 14:00-14:20** Moran Bercovici, *Technion IIT*, Israel  
Accelerated hybridization of DNA using isotachopheresis, and application to rapid detection of bacteria



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- 14:20-14:40** Shai Arnon, *BGU, Israel*  
Evaluating nutrient dynamics in streams using a combination of microelectrodes and an online UV-VIS spectrophotometer
- 14:40-15:00** Marco Keiluweit, *Oregon State University, USA*  
Advanced microprobe and imaging techniques to study soil organic matter dynamics in the rhizosphere
- 15:00-15:30** **Discussion**
- 15:30-15:50** **Coffee break**

## Session 7 continued

### Remote Sensing for Precision Fertilization

#### Chaired by Victor Alchanatis

- 15:50-16:20** Kenneth Sudduth, *University of Missouri/USDA, USA*  
Sensor-based precision fertilization for field crops
- 16:20-16:40** Anatoly Gitelson, *University of Nebraska-Lincoln, USA*  
Remote estimation of chlorophyll and nitrogen content in crops: from close range to satellites
- 16:40-17:00** Victor Alchanatis, *ARO, The Volcani Center, Israel*  
Remote sensing for fertilization management in irrigated crops
- 17:00-17:20** Yafit Cohen, *ARO, The Volcani Center, Israel*  
Spectral data and hyperspectral images to evaluate nitrogen level in potato fields
- 17:20-17:50** **Discussion**
- 18:00 - Shuttle to Hotels and Train station**



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## Thursday, 7<sup>th</sup> March

8:30-9:00 Registration

### Session 8

#### Carbon and C-N Interactions in Soils

Chaired by Asher Bar-Tal

- 9:00-9:30 Will Horwath, *UC-Davis*, USA  
New insights on C and N cycling in soils using advanced instrumentation: Are there new paradigms?
- 9:30-9:55 Dan Yakir, *Weizmann Institute of Science* Israel  
Large increase in carbon sequestration without a change in N budget in a semi-arid afforestation system
- 9:55-10:20 Dror Hawlena, *Hebrew University of Jerusalem*, Israel  
Using food-web dynamics to explain variation in carbon and nitrogen cycling
- 10:20-10:40 Mikhail Borisover, *ARO, The Volcani Center*, Israel  
Humic-like and proteinaceous components of organic matter in aquatic and soil environments: Quantification using excitation-emission fluorescence spectroscopy
- 10:40-11:00 Discussion
- 11:00-11:20 Coffee break

### Session 9

#### Soil Organic Matter and Environmental Aspects

Chaired by Mike Castellano

- 11:20-11:40 Asher Bar-Tal, *ARO, The Volcani Center*, Israel  
Contribution of carbonate dissolution to CO<sub>2</sub> emission from soils with addition of organic N
- 11:40-12:00 Ilya Gelfand, *Michigan State University*, USA  
Nitrous oxide and carbon dioxide emissions from agricultural soils: the role of soil carbon, nitrogen, and water availability





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- 12:00-12:20** Myah Goldstein, *Hebrew University of Jerusalem, Israel*  
Contaminants of emerging concern in the agro-environments: Fate and processes
- 12:20-12:40** Anat Bernstein, *ARO, The Volcani Center, Israel*  
Use of stable isotopes to study the fate of organic pollutants in soils
- 12:40-13:00** Ishai Dror, *Weizmann Institute of Science, Israel*  
Irreversible impacts of micro-pollutants on natural soils
- 13:00-13:20** Discussion
- 13:20-14:00** Lunch

## Concluding Session

### Panel discussion "Where do we go from here"?

Chaired by David Myrold and Avi Shaviv

**14:00-15:45** Panel members- Asher Bar-Tal; Achim Dobermann; Barbara Cade-Menun; Tom Schmidt; Will Horwath

16:00 - Shuttle to Hotels and Train station

## Friday, 8<sup>th</sup> March

### Professional Tour:

"Shefer Nurseries Ltd." - Kfar Bialik (Haifa Bay); "Eshkol Site"- Visitor center of Mekorot (Israel National Water Co.); Old City of Acre;

Bus leaves Nof Hotel at 8:15; Marom Hotel at 8:25; Return around 18:00.



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## List of Posters

### Graduate Students

(First authors/presenters only)

Shahar Baram, *Ben-Gurion University of the Negev, Israel*  
Spatial analysis of vadose zone data to assess the impacts of dairy waste lagoons on groundwater quality

Sarit Brand, *The Hebrew University of Jerusalem, Israel*  
Solution extraction of altered wetland soils – reexamination of standard methods

Ran Erel, *The Hebrew University of Jerusalem, Israel*  
The use of leaf analysis for diagnosing nitrogen nutrition in olive: limitations and a new conceptual approach

Avner Gross, *The Hebrew University of Jerusalem, Israel*  
The use of phosphate oxygen isotopes for identifying atmospheric-P sources – A case study at Lake Kinneret

Moshe Halpern, *McGill University, Canada and ARO, The Volcani Center, Israel*  
Long term tillage and residue management influences soil carbon and nitrogen dynamics

Hila Hecht, *ARO, The Volcani Center, Israel*  
Greenhouse gas fluxes from soil amended with sewage sludge stabilized by different techniques

Yonatan Keren, *ARO, The Volcani Center, Israel*  
Olive Oil Production Wastewater (OPWW) Disposed in the Field: The effect on soil-organic chemical interactions

Oz Kira, *Technion, IIT, Israel*  
New and innovative measuring method combining FTIR-ATR spectroscopy and stable isotopes to investigate the kinetics of nitrogen transformations in soils

Jin Liu, *Zhejiang University, China, SPARC, Canada*  
Phosphorus Speciation in Soil Colloids of an Ultisol by Solution <sup>31</sup>P-NMR and P K-edge Xanes Spectroscopy

William Osterholz, *Iowa State University, USA*  
Nitrous oxide emissions from the Wisconsin Integrated Cropping Systems Trial (WICST)



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Hanna Ouaknin, *Technion, IIT, Israel*

Use and calibration of a wall-assimilated TDR probe for various soils

Tarin Paz-Kagan, *Ben-Gurion University of the Negev, Israel*

Assessing ecosystem function by spectral soil quality index (SSQI) using reflectance spectroscopy

Iael Raji, *Ben-Gurion University of the Negev, Israel*

Volume and time optimization for water and solute balances using in-situ drainage lysimeters for field crops

Amos Russak, *Ben-Gurion University of the Negev, Israel*

Nutrients in the fresh-saline water interface of coastal aquifers

Mollie Sacks, *ARO, The Volcani Center, Israel*

Optimization of the fertigation regime of cherry tomatoes

Mohamed Samara, *ARO, The Volcani Center, Israel*

Physico-chemical characterization of olive oil mill effluents

Alla Usyskin, *The Hebrew University of Jerusalem, Israel*

Interactions of Antibacterial Triclosan with soils and sewage organic wastes: The implication for sorption by sludge-amended soils

Elazar Volk, *Technion, IIT, Israel*

Adsorption of hydrophilic and hydrophobic molecules to thermally treated clay minerals

## Researchers

(First authors/presenters only)

Dilek Anac, *Ege University, Turkey*

Response of German Chamomile to different conventional and organic nutrition systems

Michaela Budňáková, *Ministry of agriculture, Czech Republic*

Results of soil testing and Land Parcel Information System – basic tools for fertiliser recommendations in Czech agricultural practice

Pavel Čermák, *Agricultural Research Organization Prague, Czech Republic*

Results of long term-experiments for optimal application rates determination in certain soil and climatic conditions



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Arnon Dag, *ARO, The Volcani Center, Israel*

Fertilization of olives irrigated with reclaimed wastewater

Nevin Eryüce, *Ege University, Faculty of Agriculture, Turkey*

Phosphorus and Zn contents of bread and durum wheat varieties as affected by N and K nutrition

Vahap Katkat, *Uludag University, Faculty of Agriculture, Turkey*

Determination of effects of solid and liquid humic substances on plant growth and soil micronutrient availability

Eva Kunzová, *Crop Research Institute, Czech Republic*

Effect of long-term P and K fertilizers application on the grain yield of spring Barley at different conditions

Feng Li, *ARO, The Volcani Center, Israel*

Leaf nitrogen content estimation in potato fields using data from ground and airborne hyperspectral images

Gdalyahu Manor, *Technion, IIT, Israel*

Undisturbed large soil core sampler for investigating nutrient dynamics

Ravid Rosenzweig, *Technion, IIT, Israel*

The Effect of Biofilms on The Hydraulic Properties of Unsaturated Soils

Ronit Rud, *ARO, The Volcani Center, Israel*

Evaluation of plant status with hyperspectral and thermal imaging: a case study of combined N and water stress in a potato field

Michaela Smatanová, *Central Institute for Supervising and Testing in Agricultural, Czech Republic*

Monitoring of the impact of intensified rate of fertilization on crop yields and soil agrochemical properties

Eli Vered, *Agronomic Development, Netafim Ltd., Israel*

Studies on drip irrigation of rice

Ibrahim Yokas, *Mugla Sıtkı Kocman University, Turkey*

The effect of phosphorus doses on nutrient content, growth, yield and quality properties of *Limonium Sinuatum*



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## Additional Information

**Accommodations:** Special rates in Haifa Hotels will be offered to participants:

Rates range between 80\$ to 110\$ for a single room and between 90\$ to 140\$ for a double room.

**Registration:** A registration fee of \$200 per person is requested to cover expenses for a conference booklet, lunches and coffee breaks. Registration can be done via the forms on <http://dgsymp13.technion.ac.il/>.

**Please note:** Registration fees for participants presenting voluntary oral presentation or posters are waived.

## Important Submission Dates

Manuscripts of presentations

By **April 30, 2013**

## Local Organizing Committee

Chair- Dr. A. Shaviv, Technion-IIT; Prof. Emeritus J. Hagin, Technion-IIT;

Dr. S. Avrahami, Ruppin Academic Center; Dr. Yael Dubovski, Technion-IIT;

Dr. V. Alchanatis, ARO, Volcani Center; Dr. A. Angert, Hebrew Uni., Jerusalem;

Dr. Paricia Imas, ICL Fertilizers;

## Scientific Committee

In addition to the scientists listed above, the scientific committee includes:

Co-Chair Dr. David Myrold, OSU, USA; Dr. Peter Bottomley, OSU, USA;

Dr. Barbara Cade-Menun, Agriculture and Agri-Food Canada.

## Symposium coordinator

Dr. Uta Cherui - [dgsymp13@tx.technion.ac.il](mailto:dgsymp13@tx.technion.ac.il) Fax:+972-4-8224246

**Detailed information and links on - <http://dgsymp13.technion.ac.il/>**