



# Carbon Management and Sequestration Center

Issue 1 | 2016



## C-MASC Group

C-MASC group meets for a weekly seminar on March 23<sup>rd</sup>, 2016. Photographed above (from left to right): Xin Zhao, Ellen Maas, Eric Stein Huifang Han, Klaus Lorenz, Muhammad Azhar, José Guzman, Eduane Padua, Nall Moonilall, Peter Renz, Sajid Hussain, Basant Rimal, Kaile Mai, Laura Hughes, Rattan Lal.

### Those not photographed above include:

### Inside this Issue

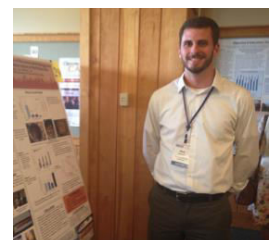
C-MASC Visitors .....	Page 2
Visiting Scholars .....	Page 4
Graduate Students .....	Page 4
C-MASC Alumni .....	Page 5
Recent Presentations ...	Page 6
Spring at C-MASC .....	Page 9
Publications .....	Page 10



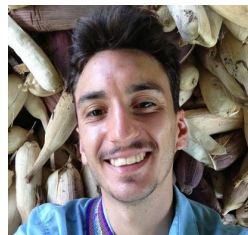
Simi Mehta



Pat Bell



Reed Johnson



Henry Peller



Chris Eidson







# Prof. Boris Boincean Visits C-MASC February 10<sup>th</sup>, 2016

Dr. Boris Boincean, author of "The Black Earth: Ecological Principles for Sustainable Agriculture on Chernozem Soils," gave a presentation on the sustainable management of Chernozem soils for C-MASC and the School of Environmental Science. Since 1985, Prof. Boincean has been a researcher at the Research Institute of Field Crops "Selectia," where he conducts long-term field experiments with crop rotations, monoculture, soil fertilization, irrigation and tillage. Since 2003, he has been the chair of Natural Sciences and Agroecology at the Alecu Russo State University in Balti (Republic of Moldova). His research interests include sustainable resource management and organic agriculture. He has published more than 270 research papers.

## Soil as World Heritage

Prof. Boris Boincean has promoted the concept of "Soil as World Heritage" at the occasion of the "International Symposium" celebrating the 50<sup>th</sup> anniversary of long-term field experiment on Chernozems, Balti, Molvoda. Proceedings of the symposium has been published as a book edited by Prof. David Dent. The site of this long-term experiment is being considered by UNESCO as a World Heritage Site for the Chernozem.







## Dr. Roshan Bajracharya Visits C-MASC January 22<sup>nd</sup>, 2016

Dr. Roshan Bajracharya professor of Soil Science at the University of Kathmandu, Nepal, visited C-MASC to present two seminar: "Sustainable agriculture in the lower Himalayas" and "Soil carbon sequestration in agroecosystems of Nepal." Dr. Bajracharya, who received his PhD from OSU in 1995, has Extensive research experience in the fields of agricultural intensification, soil and water conservation, soil crusting and erosion/modeling, land use and management, soil carbon dynamics, and carbon sequestration in relation to climate change. His research interest are similar to those of C-MASC and involve climate change impacts on environment, agriculture and sustainable production, soil and water conservation, land management, soil carbon dynamics and sequestration as related to climate change, soil genesis and morphology, soil bio-physics and soil quality.

### Some Articles about the "4 per 1000" Initiative:

Lal, R. 2016. Beyond COP21: Potential and challenges of the "4 per Thousand" initiative. *Journal of Soil and Water Conservation* [71:20A-25A](#)

Lal, R. 2015. Cover cropping and the "4 per thousand proposal" *Journal of Soil Water Conservation* [70:141A](#)

Photo: Natalia Bratslavsky - stock.adobe.com



"France's '4 per 1000' initiative has a global significance. It raises the importance of world soils and of agriculture as a solution to the major global issue of the 21st century."

- Rattan Lal  
President Elect, International Union of Soil Sciences





# Introducing New Visiting Scholars



## Muhammad Azhar

PhD Student  
University of Agriculture Faisalabad  
Punjab, Pakistan

I acknowledge Higher Education Commission (HEC) of Pakistan and C-MASC, OSU for this opportunity.

**My PHD Thesis Title is “Phyto-availability of cadmium to rice and wheat in contaminated soil treated with organic amendments”.**

My other Research interests are on soil and environmental chemistry, Heavy metals, Carbon sequestration.

I strongly believe on Hard Work to improve the performance. To explore the opportunity and support and encourage others are included in my ambition/slogan. After completing PHD, I will try my level best to put my share for the facilitation of humanity. I am feeling fortunate to be the part of C-MASC and working with world renowned scientists.

## Dr. Huifang Han

Associate Professor  
Agronomy College  
Shandong Agricultural University  
Tai'sn Shandong, P.R. China

Huifang Han is an associate professor of Agronomy from Shandong Agricultural University of China. She acknowledge National Nature Science Foundation of China, the Cooperative Innovation Center of Efficient Production with High Annual Yield Wheat and Corn of Shandong Province, P.R. China, and the Ohio State University for this opportunity.

Huifang Han's PHD thesis title is “Research on carbon and water efficient utilization in summer maize field under conservational tillage in the Huanghuaihai Plain”. Her research interests are sustaining soil science and crop cultivation, especially on carbon management. In these fields, She was funding by two National Natural Science Foundations of China and one Natural Science Foundation of Shandong province. Also, she has published over 15 academic articles related to these fields. After achieved many goals, she is confident upon her skills and educational background, which would allow her to new height of success.







## Graduate Student News

### Henry Peller

McS Student

Henry Peller, a graduate student in the Carbon Management and Sequestration Center, was awarded a Borlaug Graduate Research Grant. This award funds scholars to produce international research of concern to global food security. Over the 18 months, Henry will perform research on land use change, soil resource mapping, and soil quality with a focus on carbon. Henry pursues masters work in Southern Belize, where he works on soil management and land use issues in Mayan territories. He hopes to make a modest contribution to the Maya people's abundant harvests and their self-governance of natural resources.



### Nall Moonilall

PhD Student

Nall was selected as a Social Media Ambassador for the upcoming Global Food Security Symposium in Washington D.C. Some of those expected to speak at the symposium include Dan Glickman, former U.S. Secretary of Agriculture; Joe Stone, Corporate Vice President and Chief Risk Officer at Cargill, Inc.; Dr. Kala Fleming, Water, Agriculture and Healthcare Research Manager, IBM.

OSU International Programs wrote [this](#) about Nall and the Global Food Security Symposium.

Congratulations Nall!





## C-MASC Alumni Research

### Antonio Pereira Filho

Assistant Professor  
State University of Campinas  
Brazil

The use of cover crops has demonstrated favorable effects on soil properties and crop yields in succession, resulting from biomass production and nutrient cycling capacity. Our research uses a plant cocktail of various plants species (legumes, grasses and oilseeds) as cover crop and green manure in no-till system during the melon crop (*Cucumis melo L.*) in Brazilian



semiarid. In the current stage of the research, we are evaluating the cocktail biomass production, the chemical content (macronutrient uptake, lignin, C/N ratio etc.), the time of biomass decomposition and the amount of macronutrients released (mineralization) by time. Among other purposes, we are seeking information about: if the plant cocktail produced enough biomass to cover the soil throughout the year; which macronutrients was accumulated in larger quantities by plant cocktail; and which the order of macronutrients, related to the quantity, was released into the soil in function of time. Subsequently, use that knowledge as alternatives in the nutritional supplement of the melon crop, reducing the use of fertilizers. However, we need to synchronize the quantity and release time of those nutrients with the melon necessity during its development.

Antonio was a Visiting Scholar at C-MASC from September 2014- February 2015, during which time he researched the "Nutrients Dynamics in the Melon Crop Under No-till and Conventional Tillage Systems with the Use of Plant Cocktails as Green Manure in Semiarid Land."





## C-MASC Alumni Recognitions



### Dr. Pramod Jha

Senior Scientist  
Indian Institute of Soil Science  
Bhopal, India

Pramod Jha, Senior Scientist, was conferred the Dr B.C. Deb Memorial Award for Soil/Physical Chemistry. The award was presented at the 103<sup>rd</sup> Session of Indian Science Congress held at the Mysuru University, Mysore (3-7 January, 2016), where he presented the topic of "Soil Carbon Dynamics and Stabilization in different Agroecosystems of India"

Dr. Jha was a Visiting Scholar at C-MASC during 2014. During this time, he researched the theme of "Long-Term Corn Stover Impacts on Soil carbon Stability and GHGs emission of No-Till Corn in Ohio".



### Dr. Veerasamy Sejian

Senior Scientist  
ICAR-National Institute of Animal Nutrition and Physiology  
Indian Council of Agricultural Research  
Audugodi, India

Dr. Veerasamy Sejian, successfully completed his stint as Endeavour Research Fellow at The University of Queensland, Queensland, Australia. It was a great opportunity for Dr. Sejian in terms of professional accomplishments. Dr. Sejian was involved in three different experiments: (1) Modeling of GHG emission in livestock farms; (2) Impact of Chronic heat stress on metabolic and inflammatory response in feedlot cattle and (3) Short term heat stress impact on plasma HSP70 and HSP27 level in feedlot cattle during his visit to UQ .

A forthcoming book on "Sheep Production Adapting to Climate Change" will be published by Springer International based on his work.

Dr. Sejian was a Visiting Scholar at C-MASC in 2010.







# Agricultural Research & Innovation Conference FACCE-JPI, 26-29 January 2016, Brussels, Belgium

Prof. Lal presented a seminar at the European Union office in Brussels on 28th January on the theme of "Soil Quality and Carbon Sequestration". The conference entitled, "Designing the Path: a strategic approach to EU Agricultural Research and Innovation" was organized by the Joint Programming Initiative on Agriculture, Food Security and Climate Change (FACCE-JPI). Dr. Jean-Francois Soussana, Scientific Director of INRA, France also was an invited speaker.

*Photographed (Above): Heather Mckhann and Maurice Héral, representatives of the FACCE JPI Secretariat.*

## C-MASC Activities on Campus



Dr. Lal presented a seminar entitled, "Solutions Under Foot: Can Soil Save Us from Ourselves?" to the School of Earth Sciences at Ohio State University.



Graduate students hard at work preparing for classes and exams (Nall Moonilall, Ellen Maas, Chris Eidson).

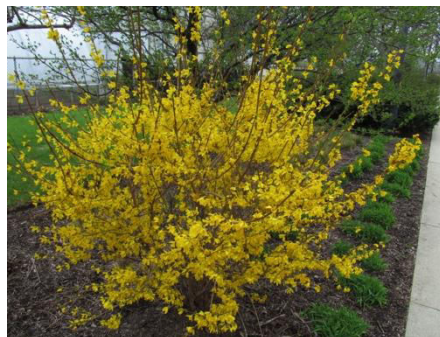




## Spring at C-MASC



*Spring at OSU* – Less than a month ago, snow dusted all the trees (above). Today, spring has brought blooms to the landscape around Kottman Hall.







### Recent C-MASC Publications

#### Journal Articles

- Das, Anup, D.P. Patel, R. Lal, Manoj Kumar, Ramkrushna, G.I., Jayanta Layek, Juri Buragohain, S.V. Ngachan, P.K. Ghosh, B.U. Choudhury and K.P. Mohapatra. 2016. Impact of fodder grasses and organic amendments on productivity and soil and crop quality in a subtropical region of eastern Himalayas, India. *Agriculture, Ecosystem and Environment* 216:274-282
- Obade, V. & Lal, R. 2016. A standardized soil quality index for diverse field conditions. *The Science of the total environment*, 541,424-34.
- Guo, L, T. Ning, L. Nie, Z. Li, R. Lal. 2016. Interaction of deep placed controlled-release urea and water retention agent on nitrogen and water use and maize yield. *Europ. J. Agronomy* 75:118-129.
- Hassan, A., Ijaz, S. S., Lal, R., Barker, D., Ansar, M., Ali, S. & Jiang, S. 2016. Tillage effect on partial budget analysis of cropping intensification under dryland farming in Punjab, Pakistan. *Archives of Agronomy and Soil Science*, 62, 151-162.
- Kong, X, X. Zhang, R. Lal, F. Zhang, X. Chen, Z. Niu, L. Han, W. Song. 2015. Groundwater depletion by Agricultural Intensification in China's HHH Plains Since 1980s. *Agronomy Journal*
- Lal, R. 2016. Beyond COP21: Potential and challenges of the "4 per Thousand" initiative. *Journal of Soil and Water Conservation* 71:20A-25A
- Liu, R., H. Zhang, R. Lal. 2016. Effects of stabilized nanoparticles of Copper, Zinc, Manganese, and Iron Oxides in low concentrations on Lettuce (*Lactuca sativa*) seed germination: nanotoxicants or nanonutrients? [Water, Air and Soil Pollution 227:42](#)
- Obade, V. and R.Lal. 2016. Toward a standard technique for soil quality assessment. [Geoderma 265:96-102](#).
- Obade, V., R. Lal. 2016. A standardized soil quality index for diverse field conditions. [Science of the Total Environment 541:424-434](#).
- Teague, R.W, S. I. Apfelbaum, R. Lal, U.P. Kreuter, J. Rountree, C. A. Davies, R. Conser, M. DeLonge, M. Rasmussen, J. Hatfield, T. Wang, P. Byck. 2016. The role of ruminants in reducing agriculture's carbon footprint in North America. *Journal of Soil and Water Conservation* 71(2):156-164.

#### Presentations

- Lal, R. 2016. The Soil-Water-Food Nexus. NCSE Conference, Washington DC, 18-20 January 2016
- Lal, R. 2016. Soil research in the Joint Programming Initiative on Agriculture, Food Security and Climate Change FACCE-JPI. FACCE-JPI Pre-Event on International Soil Research, January 27, 2016, Brussels
- Lal, R. 2016. International Union of Soil Science. FACCE-JPI Pre-Event on International Soil Research, January 27, 2016, Brussels.
- Lal, R. 2016. Solutions Under Foot: Can Soil Save Us from Ourselves. School of Earth Science, Ohio State University, 25 February 2016, Columbus.
- Lal, R. 2016. Tenets of Soil Quality Management. Pakistan

#### Forthcoming Books from C-MASC

- Lal, R (Ed). 2016. *Encyclopedia of Soil Science*, Third Edition. Taylor and Francis, Boca Raton, FL.
- Lal, R. and B.A. Stewart (Ed). 2016. *Soil Phosphorus*. *Advances in Soil Science*. Taylor and Francis, Boca Raton, FL.
- Lal, R., D. Kryabill, B.R. Singh, T. Mosogoya, L.O. Eik and D.O. Hansen (Eds). 2016. *Climate Change And Multi-dimensional Sustainability in African Agriculture*. Springer, Dordrecht.

#### Conferences Pertinent to Soil and Climate

- 2016 IUSS Inter-Congress Meeting, 20-25 November 2016, Rio, Brazil.
- "Emerging Technologies for Global Food Security," 14-16 June, Saskatoon, Canada
- International Conference on Pulses, 18-20 April 2016, Marrakech, Morocco.
- Third WASWC Conference, 22-26 August, Belgrade University, Serbia.

**Do you have contributions for our next newsletter?  
Please contact us!**

Carbon Management and Sequestration Center (C-MASC)  
210 Kottman Hall, 2021 Coffey Rd.  
Columbus, OH 43210 email [hughes.1255@osu.edu](mailto:hughes.1255@osu.edu)