

# ***“Climate change, reactive nitrogen, food security and sustainable agriculture”***

**15-16 April, 2019 Garmisch-Partenkirchen, Germany**



## **Brief description and objective**

The objective of this workshop is to bring together leading experts in the field of food security, soil science and greenhouse gas emissions from soils to discuss the current knowledge on and establish a global research network for N<sub>2</sub>O mitigation and denitrification in fertilised cropping systems. The participants will present and discuss latest research findings and policy developments on the trade-offs between crop productivity, N fertilizer use, and GHG emissions of agricultural ecosystems around the globe, with the aim of identifying hotspots and knowledge gaps of denitrification and N<sub>2</sub>O emissions, reducing uncertainty of flux estimates, and establishing consistent standards for methodologies. This workshop will provide a framework for international cooperation in key research and policy areas of food, soil, water and climate change with proven international experts.

Outputs from the workshop will include 1) a summary paper (and policy brief) describing the current state of knowledge on agricultural denitrification and N<sub>2</sub>O emissions with a focus on how to best address existing knowledge gaps; 2) a common and comprehensive database for collective data sharing that will aid in the refinement of existing biogeochemical models for the development of robust globally significant management strategies for environmentally and economically sustainable food production; and 3) standardization of methodologies to further reduce uncertainties and enhance model development.

## List of invited speakers:

- 1) **Dr David Kanter**, USA, New York University. *"The International Nitrogen Initiative: overview"*
- 2) **Prof Claudia Wagner-Riddle**, University of Guelph, Canada. *"N<sub>2</sub>O fluxes during freeze/thaw"*
- 3) **Prof Elizabeth Baggs**, University of Edinburgh, UK. *"Hotspots of N<sub>2</sub>O production"*
- 4) **Dr Laura Cardenas**, Rothamsted Research, UK. *"Denitrification from manure deposited by grazing livestock"*
- 5) **Prof Tim Clough**, New Zealand, Lincoln University. *"N<sub>2</sub>O emissions from grazing lands"*
- 6) **Dr Guntur Venkata Subbarao**, International Research Center for Agricultural Sciences, Japan. *"The role of biological nitrification inhibitors in reducing N losses from agriculture"*
- 7) **Prof Lars Bakken**, Norwegian University of Life Sciences. *"How can microbiologists help with N<sub>2</sub>O mitigation?"*
- 8) **Dr Louise Barton**, University of Western Australia. *"Importance of sampling frequency in reducing uncertainty"*
- 9) **Dr Stephen DelGrosso**, USDA ARS, USA. *"Modelling denitrification and N<sub>2</sub>O emissions from fertilised cropping systems using DayCent"*
- 10) **Prof Ute Skiba**, Centre for Ecology and Hydrology, UK. *"Bayesian approach for quantifying uncertainty in N<sub>2</sub>O fluxes"*
- 11) **Dr Stephen Ogle**, Colorado State University, USA. *"Importance of accurate activity data for national GHG inventory reporting"*
- 12) **Dr Marta Alfaro**, Instituto Nacional de Investigaciones Agropecuarias, Chile. *"Chilean national program for agricultural GHG mitigation"*
- 13) **Dr Ward Smith**, Agriculture and Agri-Food Canada *"Modelling approach for identifying management practices that reduce GHG emissions from cropping systems in Canada"*
- 14) **Prof Klaus Butterbach-Bahl**, Institute of Meteorology and Climate Research, Germany. *"Climate change, reactive N, denitrification and N<sub>2</sub>O: identifying sustainable solutions for the globe."*
- 15) **Prof Peter Grace**, Queensland University of Technology, Australia. *"The Australian National Agricultural Nitrous Oxide Research Program."*
- 16) **Dr Søren O. Petersen**, Aarhus University, Denmark. *"Manure greenhouse gas emissions: Prediction and mitigation"*
- 17) **Prof Pascal Boeckx**, University of Gent, Belgium. *"Nitrogen cycling and N<sub>2</sub>O fluxes from agroforestry"*

- 18) **Dr Sonja Leitner**, International Livestock Research, Kenya. *“N<sub>2</sub>O fluxes from smallholder, African farms”*
- 19) **Dr Chunsheng Hu**, Key Laboratory of Agricultural Water Resources, China. *“N<sub>2</sub> production via aerobic pathways”*
- 20) **Dr. Johannes Friedl**, Queensland University of Technology, Australia. *“Measuring denitrification and N turnover from fertilised cropping systems using stable isotopes”*
- 21) **Dr Raia Massad**, INRA, France. *“Modeling and mapping N<sub>2</sub>O emissions at the landscape scale”*
- 22) **Dr Wilfried Winiwarter** IIASA, Laxenburg, Austria *“Global budgets of nitrous oxide under GCP/INI, the contribution of the global N<sub>2</sub>O intercomparison project, and refinements to regionally assess diverse drivers, fluxes, and impacts (RECCAP-2)”*
- 23) **Dr Iris Vogeler**, Aarhus University, Denmark. *„ Comparison of APSIM and DNDC when predicting N<sub>2</sub>O emissions from urine patches*
- 24) **Dr Chris Dorich**, Colorado State University, USA *“Improving Global N<sub>2</sub>O Emission Estimates Through the use of a Global N<sub>2</sub>O Database”*