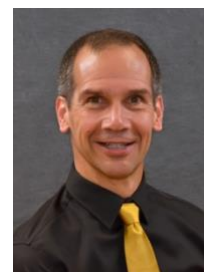


## Thomas (Tom) W. Bruulsema



An experienced scientist with a passion for nutrient stewardship in agriculture, I have worked with industry, environmental, and scientific groups to lead agricultural service providers in advancing sustainability. Recent achievements include contributions to nutrient stewardship certification programs in Ohio, Michigan, Indiana and Ontario, and to international initiatives in sustainable management of nitrogen and phosphorus.

### Experience

Professional service positions:

- 2019 - Chair, [Scientific Panel on Responsible Plant Nutrition](#)
- 2017 - 2021 Chair, 4R Research Fund Technical Advisory Group
- 2017 - 2019 Member, NSERC Geosciences Evaluation Group
- 2017 - 2019 Chair, [SERA17](#) Phosphorus Information Exchange Group
- 2015 - UNEP Global Partnership on Nutrient Management – Phosphorus Task Team
- 2014 - 2019 Nutrient Stewardship Working Group, International Fertilizer Association
- 2013 - 4R & Sustainability Committees, The Fertilizer Institute
- 2005 - 2011 President, Canadian Society of Agronomy
- 2007 - 2010 Director, American Society of Agronomy Board (ICCA Representative)
- 2005 - 2007 Chair, Division S-8, Soil Science Society of America
- 2001 - 2004 Chair, International Certified Crop Adviser (ICCA) Board
- 2000 - 2013 Nutrients Committee, Fertilizer Canada
- 1999 - 2003 President, NE Branch, American Society of Agronomy & Soil Science Society of America
- 1999 - 2000 Chair, Ontario Certified Crop Adviser Board
- 1995 - 2005 Chair, Agronomy Committee, Ontario Agri Business Association
- 1995 - 1998 Chair, Ontario Certified Crop Adviser Exam Committee

- |   |                 |
|---|-----------------|
| Plant Nutrition Canada, Chief Scientist   | since July 2019 |
| <i>Applying science in support of industry efforts to advance nutrient stewardship.</i>     |                 |
| International Plant Nutrition Institute ( <i>Potash &amp; Phosphate Institute to 2006</i> ) | 1995 to 2019    |
| Vice President, Americas & Research, July 2017 – June 2019                                  |                 |
| Phosphorus Program Director, 2015-2017  |                 |
| Director, Eastern Canada and Northeast United States Region, 1995-2015                      |                 |
| University of Minnesota, Department of Soil Science, postdoctoral research associate        | 1994            |
| Mennonite Central Committee, Research Agronomist, Bangladesh                                | 1986 - 1990     |

### Education

- PhD, 1994, Soil Science, Cornell University, Ithaca, New York  
*"Seasonal Dynamics of Nitrate Leaching and Active Soil Organic Nitrogen under Maize and Wheat"*
- MSc, 1985, Crop Science, University of Guelph, Ontario  
*"Nitrogen Contribution from Plowdown of Alfalfa and Red Clover to Succeeding Crops"*
- BSc, 1983, Agriculture, University of Guelph, Ontario

### Awards & Scholarships

- |  |      |
|--|------|
| Agronomic Industry Award, American Society of Agronomy                             | 2014 |
| Fellow, Canadian Society of Agronomy   | 2012 |
| Outstanding Reviewer, Canadian Journal of Plant Science                            | 2010 |
| Fellow, Soil Science Society of America  | 2008 |
| Fellow, American Society of Agronomy   | 2007 |
| Canadian Fertilizer Institute Award of Merit                                       | 2006 |
| Outstanding Service Award, International CCA Program, American Society of Agronomy | 2004 |

## Professional Affiliation

American Association for the Advancement of Science  
American Society of Agronomy  
Soil Science Society of America  
Crop Science Society of America

Soil and Water Conservation Society  
Gamma Sigma Delta Honor Society  
Canadian Society of Agronomy  
Canadian Society of Soil Science

## Languages

Fluent in English, functional knowledge of French and Bengali.

**Publications:** 280 (28 peer-reviewed, Scopus h-index 15, Google Scholar h-index 29)

**Presentations:** 370+; 200+ invited

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[tom.bruulsema@plantnutrition.ca](mailto:tom.bruulsema@plantnutrition.ca) Cell: 519-835-2498  
<https://orcid.org/0000-0003-1777-2421>

## Selected Recent Publications:

1. Zhang, X., T. Zou, L. Lassaletta, N.D. Mueller, F.N. Tubiello, ...**T. Bruulsema**, et al. 2021. Quantification of global and national nitrogen budgets for crop production. *Nat. Food*. doi: 10.1038/s43016-021-00318-5.
2. Maaz, T.M., T.B. Sapkota, A.J. Eagle, M.B. Kantar, **T.W. Bruulsema**, et al. 2021. Meta-analysis of yield and nitrous oxide outcomes for nitrogen management in agriculture. *Glob. Chang. Biol.*  
<https://doi.org/10.1111/gcb.15588>
3. Machado, PVF, K Neufeld, SE Brown, PR Voroney, **TW Bruulsema** & C Wagner-Riddle. 2020. High temporal resolution nitrous oxide fluxes from corn (*Zea mays* L.) in response to the combined use of nitrification and urease inhibitors. *Agriculture, Ecosystems & Environment*, 300, 106996.  
<https://doi.org/10.1016/j.agee.2020.106996>
4. **Bruulsema**, TW, HM Peterson, LI Prochnow. 2019. The Science of 4R Nutrient Stewardship for Phosphorus Management across Latitudes. *J. Environ. Qual.* <https://doi.org/10.2134/jeq2019.02.0065>
5. Machado, PVF, C Wagner-Riddle, R MacTavish, PR Voroney, & **TW Bruulsema**. 2019. Diurnal Variation and Sampling Frequency Effects on Nitrous Oxide Emissions Following Nitrogen Fertilization and Spring-Thaw Events. *Soil Sci Soc Am J.* <https://doi.org/10.2136/sssaj2018.10.0365>
6. Maaz, TM, S Waldo, TW **Bruulsema** & R Mikkelsen. 2018. Inconsistencies undermine the conclusion that agriculture is a dominant source of NO<sub>x</sub> in California. *Science Advances*, 4(9).  
<https://advances.sciencemag.org/content/4/9/eaat4706.abstract>
7. Jarvie, Helen P, LT Johnson, AN Sharpley, DR Smith, DB Baker, **TW Bruulsema**, R Confesor. 2016. Increased soluble phosphorus loads to Lake Erie: unintended consequences of conservation practices? *Journal of Environmental Quality* doi:10.2134/jeq2016.07.0248 [JEQ 2018 Best Paper Award]
8. Powers SM, **Bruulsema TW**, Burt TP, Chan N, Elser JJ, Haygarth PM, Howden NJK, Jarvie HP, Lyu Y, Peterson HM, Sharpley AN, Shen J, Worrall J, Zhang F. 2016. Long-term accumulation and transport of anthropogenic phosphorus in three river basins. *Nature Geoscience*. DOI: 10.1038/ngeo2693.
9. Robertson, GP, **TW Bruulsema**, RJ Gehl, D Kanter, DL Mauzerall, CA Rotz, CO Williams. 2012. Nitrogen-climate interactions in US agriculture. *Biogeochemistry* DOI: 10.1007/s10533-012-9802-4.
10. Snyder, CS, **TW Bruulsema**, TL Jensen, PE Fixen. 2009. Review of greenhouse gas emissions from crop production systems and fertilizer management effects. *Agriculture, Ecosystems & Environment* 133 (3-4), 247-26.

## Recent Invited Presentations:

1. 15 July 2021 – “Responsible phosphorus management seeks high yields and shows care for the environment” presented online to INTAGRI International Congress on Plant Nutrition and Physiology, Mexico.
2. 7 July 2021 – [A New Paradigm for Plant Nutrition](#) presented online to Science Days for the UN Food Systems Summit.
3. 17 March 2021 – “[Responsible Plant Nutrition & Water Quality](#).” Webinar presentation to the University of Waterloo Lake Futures Steering Committee.
4. 19 November 2020 – “Nutrient Stewardship Strategy for Western Canadian Agriculture.” Webinar presentation to Alberta Institute of Agrologists.
5. 21 October 2020. Improving the effectiveness and efficiency of nitrogen management for maize and wheat. International Symposium on Nitrogen Use Efficiency in Agriculture. Hosted by the Mexican Society of Soil Science, and CIMMYT.
6. 19 November 2019. Science & Extension: What do we know and yet not know? Presented at the [High Level Forum on Sustainable Plant Nutrition](#), Versailles, France.
7. 7 January 2019. The Science of 4R Nutrient Stewardship for Phosphorus Management across Latitudes. Presented at the 2018-2019 International Soils Meeting, San Diego, CA, USA.
8. 13 November 2018. Phosphorus Scenarios. Presented in Panel 2: “A new green revolution without mineral fertilizer? New pathways towards sustainable intensification” at the Foresight@CGIAR workshop at the University of Washington in Seattle.
9. 11 October 2018. 4R Nutrient Stewardship for Mitigation of Ammonia Losses. Presented at TFRN-13 (UNECE Convention on Long-range Transboundary Air Pollution) – the 13<sup>th</sup> meeting of the Task Force on Reactive Nitrogen, held in Ottawa, Canada..
10. 16 August 2018. Comparing phosphorus legacies in temperate and tropical soils. Presented in the interdivisional symposium on Sustainable P fertilizer use in tropical soils at the [21<sup>st</sup> World Congress of Soil Science](#), Rio, Brazil.
11. 31 January and 1 February 2017. Soil Test Levels in North America in relation to phosphorus sustainability. Presented at FarmTech 2017 in Edmonton, Alberta, Canada.

## Selected recent books and book chapters:

1. IPNI. 2016. 4R Plant Nutrition: A manual for improving the management of plant nutrition. Bruulsema, TW, PE Fixen and GD Sulewski, eds. International Plant Nutrition Institute, Norcross, GA, USA.
2. Fixen P, F Brentrup, T Bruulsema, F Garcia, R Norton, S Zingore. 2015. Nutrient/fertilizer use efficiency: measurement, current situation and trends. Chapter 2 in Drechsel, P., Heffer, P., Magen, H., Mikkelsen, R., Wichelns, D. (Eds.) 2015. Managing Water and Fertilizer for Sustainable Agricultural Intensification. International Fertilizer Industry Association (IFA), International Water Management Institute (IWMI), International Plant Nutrition Institute (IPNI), and International Potash Institute (IPI). First edition, Paris, France. ISBN 979-10-92366-02-0.
3. Deen, B, K Janovicek, TW Bruulsema, J Lauzon. 2014. Predicting year-year field level variation in maize nitrogen fertilizer requirement. In Proceedings of the 18th Nitrogen Workshop, The Nitrogen Challenge: Building a Blueprint for Nitrogen Use Efficiency and Food Security. Lisbon, Portugal, 30th June – 3rd July 2014. Editor: Cláudia M. d. S. Cordovil.
4. Bittman, S, JR Brook, A Bleeker, TW Bruulsema. 2014. Air Quality, Health Effects and Management of Ammonia Emissions from Fertilizers. Air Quality Management, 261-277. Springer, Netherlands.
5. Bruulsema, TW, P Heffer, RM Welch, I Cakmak, K Moran, eds. 2012. Fertilizing crops to improve human health: a scientific review. IPNI, Norcross, GA, USA; IFA, Paris, France. ISBN: 978-0-9834988-0-3.