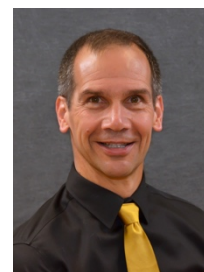


Thomas (Tom) W. Bruulsema



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:

2017 - Chair, 4R Research Fund Technical Advisory Group
2017 - 2019 Member, NSERC Geosciences Evaluation Group
2017 - 2019 Chair, SERA17 Phosphorus Information Exchange Group <https://sera17.org/about/>
2015 - UNEP Global Partnership on Nutrient Management – Phosphorus Task Team
2014 - 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 - 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

International Plant Nutrition Institute of Canada, Chief Scientist since July 2019
Applying science in support of industry efforts to advance nutrient stewardship.
International Plant Nutrition Institute (*Potash & Phosphate Institute to 2006*) 1995 to 2019
Leading a group of 9-12 agronomic scientists in the Americas in their mission to deliver scientific information to advance the responsible management of plant nutrition.
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: 277 (25 peer-reviewed; Google Scholar h-index: 24)

Presentations: 370+; 200+ invited

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tom.bruulsema@ipni.net Cell: 519-835-2498
<https://orcid.org/0000-0003-1777-2421>

Selected Recent Publications:

1. **Bruulsema, TW, HM Peterson, LI Prochnow.** 2019. The Science of 4R Nutrient Stewardship for Phosphorus Management across Latitudes. *J. Environ. Qual.* doi:10.2134/jeq2019.02.0065
2. Ferrari Machado, PV, 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>
3. Macintosh, KA, DG Doody, PJA Withers, R McDowell, DR Smith, LT Johnson, **TW Bruulsema**, V O'Flaherty and JW McGrath. 2019. Transforming soil phosphorus fertility management strategies to support the delivery of multiple ecosystem services from agricultural systems. *Science of The Total Environment* 649:90-98. ISSN 0048-9697 <https://doi.org/10.1016/j.scitotenv.2018.08.272>.
4. **Bruulsema, TW.** 2018. Managing nutrients to mitigate soil pollution. *Environmental Pollution*, ISSN 0269-7491, <https://doi.org/10.1016/j.envpol.2018.09.132>.
5. Maaz, TM, S Waldo, TW **Bruulsema** & R Mikkelsen. 2018. Inconsistencies undermine the conclusion that agriculture is a dominant source of NO_x in California. *Science Advances*, 4(9). Retrieved from <http://advances.sciencemag.org/content/4/9/eaat4706.abstract>
6. George, TS, CD Giles, D Menezes-Blackburn, ..., **TW Bruulsema**, et al. (102 authors). 2017. Organic phosphorus in the terrestrial environment: a perspective on the state of the art and future priorities. *Plant Soil.* <https://doi.org/10.1007/s11104-017-3488-2>
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.

Selected recent books and book chapters:

1. 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.
2. 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.
3. 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.
4. 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.
5. IPNI. 2012. *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.

Recent Invited Presentations:

1. 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.
2. 11 October 2018. 4R Nutrient Stewardship for Mitigation of Ammonia Losses. Presented at TFRN-13 (UNECE Convention on Long-range Transboundary Air Pollution) – the 13th meeting of the Task Force on Reactive Nitrogen, held in Ottawa, Canada..
3. 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 21st World Congress of Soil Science, Rio, Brazil. <https://www.21wcss.org/?secao=conteudo&id=92>
4. 14 March 2017. Phosphorus Product Properties for 4R Nutrient Stewardship. Presented at CRU Phosphates 2017 in Tampa, Florida, USA.
5. 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.
6. 25 January 2017. Managing Phosphorus Losses in Drainage Water from Croplands. Presented at the 59th annual convention of the Land Improvement Contractors of Ontario, in London, Ontario, Canada.
7. 24 January 2017. Managing Phosphorus 4R Crops and Environment – Ontario. Presented at the Sylvite Agronomy Meeting in London, Ontario, Canada.
8. 4-5 January 2017. Sustainable Phosphorus. Presented at the Southwest Agricultural Conference, Ridgetown, Ontario, Canada.
9. 21 November 2016. 4R Implementation in Ontario: Phosphorus & Sustainability. Ontario Federation of Agriculture 2016 Annual General Meeting “Precision Matters” in Toronto, Ontario, Canada.
10. 3 August 2016. Phosphorus Fertilizer Decisions. Presented at the Information Agriculture Conference, InfoAg 2016, in St. Louis, Missouri.