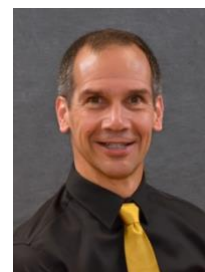


Thomas (Tom) W. Bruulsema



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 - Member, [Scientific Panel on Responsible Plant Nutrition \(chair 2019-2022\)](#)
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 – Steering Committee
2014 - 2019 Nutrient Stewardship Working Group, International Fertilizer Association
2013 - Member, 4R Committee, 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 - Member, 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 & 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: 290+ (36 peer-reviewed scientific, Scopus h-index 22, Google Scholar h-index 37)
[Sage Public Policy](#) citations: 89

Presentations: 370+; 200+ invited

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

Selected Recent Publications:

1. B Vanlauwe, PH Brown, **T Bruulsema**, A Dobermann, M Hungria, K Majumdar, M McLaughlin, C Wagner-Riddle, X Zhang, F Zhao. 2024. Fertilizer and soil health for enhanced productivity and sustainability in sub-Saharan Africa. [Issue Brief 06](#). Scientific Panel on Responsible Plant Nutrition, Paris, France.
2. **Bruulsema**, T, L Nigon, and R Mikkelsen. 2024. 4R Nutrient Management for Magnesium. *Crops & Soils* n/a(n/a). doi: [10.1002/crso.20377](https://doi.org/10.1002/crso.20377).
3. **Bruulsema**, T, and R Olson. 2024. The Role of Sulfur in Meeting 4R Nutrient Stewardship Goals. *Crops & Soils* 57(3): 34–39. doi: [10.1002/crso.20360](https://doi.org/10.1002/crso.20360).
4. **Bruulsema**, T, D Ashford-Kornburger, L Nigon, and N Menheere. 2024. Getting Support for Adoption of Climate-Smart 4R Practices. *Crops & Soils* doi: [10.1002/crso.20345](https://doi.org/10.1002/crso.20345).
5. **Bruulsema**, T, and L.L. Nigon. 2023. What Is a 4R Plant Nutrient? *Crops & Soils* n/a(n/a). doi: [10.1002/crso.20320](https://doi.org/10.1002/crso.20320).
6. Nigon, LL, and T **Bruulsema**. 2023. Understanding Biostimulants and Their Tie to Soil Fertility. *Crops & Soils* 56(5): 29–35. doi: [10.1002/crso.20303](https://doi.org/10.1002/crso.20303).
7. Nigon, LL, and T **Bruulsema**. 2023. Assessing Soil Potassium: Basic Principles and New Developments. *Crops & Soils* 1. doi: [10.1002/CRSO.20256](https://doi.org/10.1002/CRSO.20256).
8. **Bruulsema**, T. 2022. What's the Scope of 4R Practices for Reducing Emissions from Fertilizer? *Crops & Soils* 55(6): 30–36. doi: [10.1002/CRSO.20233](https://doi.org/10.1002/CRSO.20233).
9. Scientific Panel on Responsible Plant Nutrition (**Bruulsema**, T et al.). 2023. Defining nutrient use efficiency in responsible plant nutrition. Issue Brief 04. Available at www.sprpn.org
10. Pearce, AW, Slaton, NA, Lyons, SE, Bolster, CH, **Bruulsema**, **TW**, Grove, et al. (2022). Defining relative yield for soil test correlation and calibration trials in the fertilizer recommendation support tool. *Soil Science Soc. Am. J.* 86:1338-1353. <https://doi.org/10.1002/saj2.20450>
11. Dobermann, A, **T Bruulsema**, I Cakmak, B Gerard, K Majumdar, et al. 2022. Responsible plant nutrition: A new paradigm to support food system transformation. *Glob. Food Sec.* 33: 100636. doi: <https://doi.org/10.1016/j.gfs.2022.100636>.
12. van Grinsven, HJM, P Ebanyat, M Glendining, Baojing Gu, R Hijbeek, Shu Kee Lam, L Lassaletta, ND Mueller, FS Pacheco, M Quemada, **TW Bruulsema**, BH Jacobsen & HFM. ten Berge. 2022. Establishing long-term nitrogen response of global cereals to assess sustainable fertilizer rates. *Nat. Food*. doi: [10.1038/s43016-021-00447-x](https://doi.org/10.1038/s43016-021-00447-x).

13. Niemeyer, C, J Nasielski, K Janovicek, **T Bruulsema**, and B Deen. 2021. Yield can explain interannual variation in optimum nitrogen rates in continuous corn. *Nutr. Cycl. Agroecosystems*. doi: [10.1007/s10705-021-10168-z](https://doi.org/10.1007/s10705-021-10168-z).
14. Zhang, X, T Zou, L Lassaletta, ND Mueller, FN 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](https://doi.org/10.1038/s43016-021-00318-5).
15. Maaz, TM, TB Sapkota, AJ Eagle, MB Kantar, **TW 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>
16. 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. *Agric. Ecosystems Environ.*, 300, 106996. <https://doi.org/10.1016/j.agee.2020.106996>
17. **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>
18. 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). <https://advances.sciencemag.org/content/4/9/eaat4706.abstract>
19. 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](https://doi.org/10.2134/jeq2016.07.0248) [JEQ 2018 Best Paper Award]
20. 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.

Recent Invited Presentations:

1. 27-29 August 2024 – “APNI 4R Nutrient Stewardship Workshop” for the African Plant Nutrition Institute, Marrakech, Morocco.
2. 18 January 2024 – “4R Nutrient Stewardship and Nitrogen Use Efficiency” at the Agrico agri-retailer meeting, Guelph, Ontario.
3. 16 November 2023 – “[Responsible Plant Nutrition for Abundant Food & Clean Water](#)” – 3rd annual guest lecture for a University of Waterloo course in Eutrophication: from Process to Water Quality Management. Department of Geography, Earth and Environmental Sciences.
4. 31 August 2023 – “[Nitrogen Use Efficiency](#)” at the First-Ever Mid-Atlantic Symposium for the DE/MD and PA 4R Alliances.
5. 14 December 2022 – “[Furthering 4R to Verify Sustainable Emissions Reduction](#)” presented at the Manitoba Agronomists Conference [online].
6. 13 December 2022 – “[Furthering 4R Nutrient Management for Sustained Productivity](#)” presented at the Indiana Certified Crop Adviser Conference, Indianapolis, IN.
7. 24 August 2022 – “Why is 4R Nutrient Stewardship an Important Strategy?” presented online to FERTASA, the Fertilizer Association of Southern Africa annual meeting.
8. 28 February 2022 – “Realigning 4R Nutrient Stewardship for Future Farming Systems” presented online by the IFA Scientific Panel on Responsible Plant Nutrition.
9. 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.
10. 7 July 2021 – [A New Paradigm for Plant Nutrition](#) presented online to Science Days for the UN Food Systems Summit.
11. 17 March 2021 – “[Responsible Plant Nutrition & Water Quality](#).” Webinar presentation to the University of Waterloo Lake Futures Steering Committee.
12. 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.

13. 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.

Selected recent books and book chapters:

1. SPRPN. 2022. Furthering 4R Nutrient Stewardship. [Issue Brief 03](#). Scientific Panel on Responsible Plant Nutrition, Paris, France.
2. 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.
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.