

Michael L. Thompson - Curriculum Vitae
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Professional Preparation

- Ohio State University, Columbus, Ph.D., Agronomy (Soil Genesis) (1980)
- University of Illinois, Urbana-Champaign, B.S., with High Honors, Agricultural Sciences (1974)

Employment

- Professor, Agronomy Department, Iowa State University, Ames (2005-present)
- Visiting Professor, School of Nat. Res. and Environ., Anhui Agricultural University, Hefei, China (2016 – 2021)
- Visiting Professor, School of Nat. Res. and Environ., Shandong Agricultural University, Tai'an, China (2018 – 2019)
- Pioneer Hi-Bred Professor of Agronomy, Agronomy Department, Iowa State University, Ames (2007 – 2010)
- Associate Professor, Agronomy Department, Iowa State University, Ames (1989-2005)
- Fulbright Junior Lecturer, Institut National Agronomique, Paris, France (October 1985 - June 1986)
- Assistant Professor, Agronomy Department, Iowa State University, Ames (1980-1989)

Recent Teaching Program

- *Environmental Soil and Water Chemistry* (with laboratory) (2003 – present)
- *Organic Compounds in Plants and Soils* (2011 – present)
- *Soil – Plant Relationships* (2015, 2016)

Current Research Program

My research program centers on environmental applications of soil chemistry and mineralogy. These studies seek to identify chemical and physical conditions that favor stability, transformations, and movement of nutrients, soil organic matter, and anthropogenic contaminants in soils. Current research projects include quantification of the impacts of biofuel cropping systems on plant nutrients in soil, the mechanisms of colloid-mediated transport of hormones derived from municipal biosolids, and the composition of organic matter preserved in Quaternary paleosols.

Awards and Honors

- **Elected to Presidential Leadership Team**, Soil Science Society of America (2023 – 2025)
- **Outstanding Reviewer**, Soil Science Society of America Journal (2021)
- **Fellow**, American Association for the Advancement of Science (2010)
- **Fellow**, Soil Science Society of America (2008) and American Society of Agronomy (2008)
- **Outstanding Associate Editor**, Journal of Environmental Quality (2008)

Professional Associations

- Soil Science Society of America
- American Society of Agronomy
- The Clay Minerals Society
- Iowa Water Environment Foundation
- American Association for the Advancement of Science

Google Scholar: [Michael Thompson - Google Scholar](#)

Recent Publications

Books

Schaetzl, R.J., and M.L. Thompson. 2015. **Soils: Genesis and Geomorphology**. Cambridge Press, New York.

Murrell TS, Mikkelsen RL, Sulewski G, Norton R, Thompson ML (eds). 2021. **Improving Potassium Recommendations for Agricultural Crops**. 455 p. Springer Nature.

Recent Refereed Journal Articles (2012-present)

Correia, B.L., J.L. Kovar, M.L. Thompson, P.S. Pavinato, and L.R.F. Alleoni. 2023. Sugarcane green harvest management influencing soil phosphorus fractions. *Soil and Tillage Research* 231, 105713

Simpson, Zachary P., Jim Jordahl, Andrea Leptin, Fernando E Miguez, Jarad Niemi, Lisa A Schulte, Michael L Thompson, Sebastián H Villarino, Marshall D McDaniel. 2023. No-tillage does not on average reduce soil carbon storage compared to conventional tillage. Comment on “Declines in soil carbon storage under no tillage can be alleviated in the long run” by Cai et al. *Geoderma* 430:116307

Sheng, Hao, Yu Gu, Zerun Yin, Yi Xue, Ping Zhou, and Michael L. Thompson. 2022. Consistent inter-annual reduction of rice cadmium in 5-year biannual organic amendment. *Sci. Total Environ.* 807, Part 3, 151026.

<https://doi.org/10.1016/j.scitotenv.2021.151026>

- Volf, M.R.; Crusciol, C.A.C.; de Azevedo, A.C.; Thompson, M.L.; Kovar, J.L.; Rosolem, C.A. 2021. Potassium bioavailability in a tropical kaolinitic soil. *Agronomy*, 11, 2016. doi.org/10.3390/agronomy11102016
- Middleton, Teresa E., Audrey L. McCombs, Stefan R. Gailans, Sarah Carlson, Douglas L. Karlen, Kenneth J. Moore, Matt Z. Liebman, Thomas C. Kaspar, Mahdi M. Al-Kaisi, David A. Laird, Mary H. Wiedenhoeff, Kathleen Delate, Cynthia A. Cambardella, Michael L. Thompson, Emily A. Heaton, Marshall D. McDaniel. 2021. Assessing biological soil health through decomposition of inexpensive household items. *Applied Soil Ecology*. 168:104099. doi.org/10.1016/j.apsoil.2021.104099.
- Sheng, H., Yin, Z., Zhou, P., and M.L. Thompson. 2021. Soil C:N:P ratio in subtropical paddy fields: Variation and correlation with environmental controls. *J. Soils Sediments* https://doi.org/10.1007/s11368-021-03046-2
- Avornyo, Vincent, Andrew Manu, David A. Laird, and Michael L. Thompson. 2021. Temperature effects on properties of rice husk biochar and calcinated Burkina phosphate rock. *Agriculture* 11:432. doi.10.3390/agriculture11050432.
- Rivas Chen, Fritzie, Benny Chefetz, and Michael L. Thompson. 2021. Comparison of adsorption behaviors of selected endocrine-disrupting compounds in soil. *J. Environ. Qual.* 50:756-767. doi: 10.1002/jeq2.20221.
- Chen, Xi, Mengcan Jin, Pu Duan, Jennifer Mejia, Wenying Chu, Xinxin Ye, Xiaoyan Cao, Klaus Schmidt-Rohr, Michael L. Thompson, Hongjian Gao, and Jingdong Mao. 2021. Structural composition of immobilized fertilizer N associated with decomposed wheat straw residues using advanced nuclear magnetic resonance spectroscopy combined with ¹³C and ¹⁵N labeling. *Geoderma*. 398:115110. doi:10.1016/j.geoderma.2021.115110.
- Kalkhajeha Y.K., B. Huang, W. Hu, C. Ma, H. Gao, M.L. Thompson, and H.C.B. Hansen. 2021. Environmental soil quality and vegetable safety under current greenhouse vegetable production management in China. *Agric. Ecosys. Environ.* 307: 107230. doi: 10.1016/j.agee.2020.107230.
- Zhang, Ligan; Chen, Xi; Xu, Yujun; Jin, Mengcan; Ye, Xinxin; Gao, Hongjian; Chu, Wenying; Mao, Jingdong; and Thompson, Michael L. 2020. Soil labile organic carbon fractions and soil enzyme activities after 10 years of continuous fertilization and wheat residue incorporation. *Sci. Rep.* 10: 11318. doi: 10.1038/s41598-020-68163-3.
- Chen, X.; X. Ye, W. Chu, D. Olk, X. Cao, K. Schmidt-Rohr, L. Zhang, M.L. Thompson, J. Mao, H. Gao. 2020. Formation of char-like, fused-ring aromatic structures from a non-pyrogenic pathway during decomposition of wheat straw. *J Agric. Food Chem.* 68:2607-2614. doi: 10.1021/acs.jafc.9b06037.
- Kalkhajeh, Y.K., B.J. Amiri, B. Huang, A.H. Khalyani, H. Wenyong, H. Gao, and M.L. Thompson. 2019. Methods for sample collection, storage, and analysis of freshwater phosphorus. *Water*. 11:1889. doi:10.3390/w11091889.
- Ma C., X. Chen, J. Zhang, Y. Zhu, Y. Kalkhajeh, R. Chai, X. Ye, H. Gao, W. Chu, J. Mao, and M.L. Thompson. 2019. Linking chemical structure of dissolved organic carbon and microbial community composition with submergence-induced soil organic carbon mineralization. *Sci. Tot. Environ.* DOI: 10.1016/j.scitotenv.2019.07.286.
- Chen, X., M. Jin, Y. Xu, W. Chu, D.C. Olk, J. Hu, Y. Jiang, J. Mao, H. Gao, and M.L. Thompson. 2019. Potential alterations in the chemical structure of soil organic matter components during NaOH extraction. *J. Environ. Qual.* 48:1578-1586.
- Rahutomo, S., J.L. Kovar, and M.L. Thompson. 2019. Malachite green method for determining phosphorus concentration in diverse matrices. *Commun. Soil Sci. Plant Anal.* DOI: 10.1080/00103624.2019.1635140.
- Forsythe, N.A., P.G. Spry, and M.L. Thompson. 2019. Low-sulfidation Au- and porphyry Cu-style mineralization, Navilawa Caldera, Fiji. *Geosciences* 9:42; DOI:10.3390/geosciences9010042.
- Rahutomo, S., J.L. Kovar, and M.L. Thompson. 2019. Phosphorus transformations in stream bank sediments in Iowa, USA, at varying redox potentials. *J. Soils Sediments*. 19:1029–1039. DOI:10.1007/s11368-018-2139-4.
- Chen, X., M. Jin, Y. Zhang, J. Hu, H. Gao, W. Chu, J. Mao, and M.L. Thompson. 2018. Nitrogen application increases abundance of recalcitrant compounds of soil organic matter: A six-year case study. *Soil Sci.* 183:169–178.
- Rahutomo, S., Kovar, J.L., and Thompson, M.L. 2018. Varying redox potential affects P release from stream bank sediments. *PLoS ONE* 13(12):e0209208. DOI: 10.1371/journal.pone.0209208.
- Ibrahim, M.A., Chua-Ona, T., Liebman, M., and M.L. Thompson. 2018. Soil organic carbon storage under biofuel cropping systems in a humid, continental climate. *Agron. J.* 110:1748-1753.
- Chen, X., Y. Xu, H. Gao, J. Mao, W. Chu, and M.L. Thompson. 2018. Biochemical stabilization of soil organic matter in straw-amended, anaerobic and aerobic soils. *Sci. Tot. Environ.* 625:1065-1073.
- Rahutomo, S., J.L. Kovar, and M.L. Thompson. 2018. Inorganic and organic phosphorus in sediments in the Walnut Creek Watershed of Central Iowa, USA. *Water, Air, & Soil Pollution* 229:72. DOI:10.1007/s11270-018-3721-5.
- Chen, X., A. Mao, Y. Zhang, L. Zhang, J. Chang, H. Gao, and M.L. Thompson. 2017. Carbon and nitrogen forms in soil organic matter influenced by incorporated wheat and corn residues. *Soil Sci. Plant Nutr.* 63:377-387.
- Liang, X., Liao, C., Soupier, M.L., Jarboe, L.R., Thompson, M.L., Dixon, P.M. 2017. *Escherichia coli* attachment to model particulates: The effects of bacterial cell characteristics and particulate properties. *PLOS ONE*. 12: e0184664. DOI: 10.1371/journal.pone.0184664.
- Liao, C., Liang, X., Yang, F., Soupier, M.L., Howe, A.C., Thompson, M.L., Jarboe, L.R. 2017. Allelic variation in outer membrane protein A and its influence on attachment of *Escherichia coli* to corn stover. *Frontiers in Microbiology* 8:708.

- Fidel, R.B., D.A. Laird, M.L. Thompson, and M. Lawrinenko. 2017. Characterization and quantification of biochar alkalinity. *Chemosphere* 167:367–373.
- Meng, Y., T. Chua-Ona, and M.L. Thompson. 2016. Short-term nitrogen mineralization potential in soils of biofuel cropping systems. *Soil Sci.* 181:503–512.
- Liang X., Liao C., M.L. Thompson, M.L. Soupir, L.R. Jarboe, and P.M. Dixon. 2016. *E. coli* surface properties differ between stream water and sediment environments. *Front. Microbiol.* 7:1732. DOI: 10.3389/fmicb.2016.01732.
- Prater J.R., R. Horton, and M.L. Thompson. 2016. Impacts of environmental colloids on the transport of 17 β -estradiol in intact soil cores. *Soil and Sediment Contamination: An International Journal* 25:164-180. DOI: 10.1080/15320383.2016.1112360.
- Gao, H., X. Chen, J. Wei, Y. Zhang, L. Zhang, J. Chang, and M.L. Thompson. 2016. Decomposition dynamics and changes in chemical composition of wheat straw residue under anaerobic and aerobic conditions. *PLOS ONE* 11:e0158172. DOI: 10.1371/journal.pone.0158172.
- Hongthanat, N., J.L. Kovar, M.L. Thompson, J.R. Russell, and T.M. Isenhardt. 2016. Phosphorus source—sink relationships of stream sediments in the Rathbun Lake watershed in southern Iowa, USA. *Environ. Monit. Assess.* 188:453-467. DOI:10.1007/s10661-016-5437-6.
- Prater, J.R., R. Horton, and M.L. Thompson. 2015. Reduction of estrone to 17 β -estradiol in the presence of swine manure colloids. *Chemosphere* 119:642–645.
- Zhou, Z., N. Chen, X. Cao, T. Chua, J. Mao, R.D. Mandel, E.A. Bettis III, and M.L. Thompson. 2014. Composition of clay-fraction organic matter in Holocene paleosols revealed by advanced solid-state NMR spectroscopy. *Geoderma* 223:54-61.
- Jarchow, M.E., M. Liebman, S. Dhungel, R. Dietzel, D. Sundberg, R.P. Anex, M.L. Thompson, and T. Chua. 2014. Trade-offs among agronomic, energetic, and environmental performance characteristics of corn and prairie bioenergy cropping systems. *GCB Bioenergy* 7:57-71. DOI:10.1111/gcbb.12096.
- Rivas, F.A., M.A. Tabatabai, D.C. Olk, M.L. Thompson. 2013. Kinetics of short-term carbon mineralization in roots of biofuel crops in soils. *Biology and Fertility of Soils* 50:527-535.
- Fidel, R.B., D.A. Laird, M.L. Thompson. 2013. Evaluation of modified Boehm titration methods for use with biochars. *Journal of Environmental Quality* 42:1771-1778.
- Mao, J.-D., R.L. Johnson, J. Lehmann, D.C. Olk, E.G. Neves, M.L. Thompson, and K. Schmidt-Rohr. 2012. Abundant and stable char residues in soils: Implications for soil fertility and carbon sequestration. *Environ. Sci. Technol.* 46: 9571–9576.

Selected Book Chapters (2012-present)

- Sandor, J.A., C.L. Burras, M.L. Thompson, and S.A. Wills . 2023. Human Impacts on soil formation. In *Encyclopedia of Soils in the Environment*, 2nd Ed. Michael J. Goss and Margaret A. Oliver (eds.).
- Bell M.J., Thompson M.L., Moody P.W. 2021. Using soil tests to evaluate plant availability of potassium in soils. In: Murrell, T.S., Mikkelsen, R.L., Sulewski, G., Norton, R., Thompson, M.L. (eds) *Improving Potassium Recommendations for Agricultural Crops*. Springer, Cham. https://doi.org/10.1007/978-3-030-59197-7_8
- Bell, M.J., M.D. Ransom, M.L. Thompson, P. Hinsinger, A.M. Florence, P.W. Moody, C.N. Guppy. 2021. Considering soil potassium pools with dissimilar plant availability. In: Murrell T.S., Mikkelsen R.L., Sulewski, G., Norton, R., Thompson, M.L. (eds) *Improving Potassium Recommendations for Agricultural Crops*. Springer, Cham. https://doi.org/10.1007/978-3-030-59197-7_7
- Graber, E.R., L. Tsechansky, R.B. Fidel, M.L. Thompson, and D.A. Laird. 2017. Determining acidic groups at biochar surfaces via the Boehm titration. In Singh, B., Camps-Arbestain, M., Lehmann, J. (eds). *Methods of Biochar Analysis*. CSIRO Publishing, Melbourne, Chapter 8.

Research Funding (2012-present)

- Evaluation of the Phosphorus Availability of Wastewater from Phosphorus Reduction Processing. Iowa Nutrient Research and Education Council. A.P. Mallarino, J.A. Sawyer, M.L. Thompson. \$71,079, shared among three PIs. 2019 – 2020.
- Limiting Nitrogen Immobilization in Cover Crop Systems. Iowa Nutrient Research Center. M.L. Thompson. \$14,300. 2017 – 2018.
- Soil Health in Biofuel Cropping Systems. Leopold Center for Sustainable Agriculture. M.L. Thompson, M. Liebman, M. Helmers. \$203,841, 2016 – 2019.
- Improving the Reliability of Soil Potassium Testing and Recommendations for Crops through Improved Knowledge of Relationships between Exchangeable and Non-Exchangeable Soil Potassium Pools, A. Mallarino and M. Thompson, International Plant Nutrition Institute, \$249,000, 2013 – 2017.

- Processes Controlling the Source, Movement, and Release of Soil Phosphorus in Midwestern Streams from Pasture and Crop Land, R. Schultz et al., USDA – National Institute for Food and Agriculture, \$498,007 (shared among 7 PIs), 10/1/2013 – 9/2017.
- Environmental Fate of Endocrine-Disrupting Chemicals: Association with Biosolids-Derived Dissolved Organic Matter, M. Thompson, B. Chefetz, R. Horton, and J. Prater. Binational Agric. Res. and Dev. Fund, \$300,000 (\$70,000 to Thompson's group), 11/2013 – 12/2016.
- Investigation of Bacteria Transport and Resistance Mechanisms and Implications for Water Quality from Confinement Swine and Beef Grazing Production Systems in Iowa. M. Soupir et al., Leopold Center for Sustainable Agriculture, \$162,100 (shared among 5 PIs), 3/2012 – 2/2015.
- Genetic and Environmental Factors Driving E. coli Attachment to Particles in Streams. M. Soupir, L. Jarboe, and M.L. Thompson. National Science Foundation. \$304,553, 2012 – 2016.
- Stabilized Organic Carbon and Paleoenvironmental Interpretations of Late Quaternary Paleosols, M. Thompson and A. Wanamaker, National Science Foundation, \$117,377, 2012 – 2015.
- Biofuel Cropping Systems for Feedstock Production and Greenhouse Gas Mitigation, M. Thompson et al., USDA – NASA – Carbon Cycle Science Program, \$ 726,500 (shared among 8 PIs), 2011 – 2015.