

Xiufen (Sophia) Li, *Ph.D.*

Assistant Professor of Soil Microbiology and Soil Health

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EDUCATION

- Ph.D. in Soil Science (focus: soil microbiology and bioinformatics), Oklahoma State University, USA
- M.S. in Ecology (focus: environmental microbiology and bioremediation), Chinese Academy of Sciences, China
- B.S. in Biotechnology, Anhui Normal University, China

EXPERIENCE

- 2023 - present: Assistant Professor of Soil Microbiology and Soil Health. Department of Plant and Environmental Sciences, New Mexico State University.
- 2020 - 2023: Postdoctoral Research Associate. Washington State University.
- 2016 - 2020: Postdoctoral Research Associate. Texas A&M AgriLife Research & Extension Center.

CURRENT FUNDED GRANTS

- 2024** Li, X., Walker, S., Ulery, A. Boosting Chile Pepper Resilience: Investigating Plant-Soil-Microbe Interactions under Drought, Salinity, and Organic Amendments in Arid and Semi-arid Climates. NMSU ACES Chile Award. Jul 2024- Jul 2026. \$60,000. Funded.
- 2024** Ulery, A.; Li, X.; Carroll, K.C.; Chamberlin, B.; Martinez, P.; Cezarotto, M. Diverse Student Learning in Soil, Microbial, and Water Sciences with Experiential Courses and Interactive Animations. Aug 2024 - Aug 2028. USDA-NIFA-HSI Education Grants Program. \$400,000. Funded.
- 2023** Friesen, M.L.; Tiemann, L.; White III, R.A.; Li, X. Functional Biodiversity of Soil Nitrogen-Fixing Microbial Communities Across Diverse Cropping Systems. USDA-NIFA Agricultural Microbiome Program (A1402). Aug 2023 - Aug 2026. \$849,135. Funded.
- 2023** Friesen, M.L.; Paulitz, T.; Li, X. A SmartChip for Pathogenic and Beneficial Microbes Underlying Soil Health. WSU FY-23 BIOAg Project. May 2023 - May 2024. \$40,000. Funded.
- 2023** Lehnhoff, E.; Beck, L.; Sims, G.; Sanogo, S.; Brungard, C.; Desmond, M; Li, X.; Idowu, J.; Flynn, R.; Ghimire, R. Land Use and Environmental Function. NMSU AES Capacity Project (Umbrella). 2023-2028. Funded.

PUBLICATIONS AND PROFESSIONAL OUTPUT

1. Recent Peer-Reviewed Articles:

- 2024** Li, X.; Wang, X.; Ma, X.; Sun, W.; Chen, K.; Dou, F. (2024). Effectiveness of nanomaterials and their counterparts in improving rice growth and yield under arsenic contamination. *Frontiers in Plant Science*. 15:1338530. doi.org/10.3389/fpls.2024.1338530.
- 2024** Li, W; Li, X.; Zhou, K.; Jin, X.; Huang, C.; Hu, R.; Lin L.; Wang, J. (2024). Exogenous γ -aminobutyric acid (GABA) improves the cadmium phytoremediation capacity of *Solanum nigrum* var. *humile* under cadmium stress. *Environmental Progress & Sustainable Energy*. doi.org/10.1002/ep.14364.

- 2024 Wang, H.; Xu, Y.; Jin, X.; Yang, M.; **Li, X.**; Dai, Z.; Zhang, D.; Zhou, K.; Lin, L. (2024). Exogenous strigolactone improves the cadmium accumulation in *Solanum nigrum* var. *humile*. *Environmental Progress & Sustainable Energy*. doi.org/10.1002/ep.14379.
- 2024 Lehnhoff, E.; Toth, C.R.; Agarwal, P.; Velasco-Cruz, C.; Schutte, B.J.; Idowu, O.J.; **Li, X.** (2024). Winter cover crops and irrigation alter soil microbial community composition in an arid cropping system. *Pedobiologia - Journal of Soil Ecology*. doi.org/10.1016/j.pedobi.2024.150986.
- 2023 Li, Z.; **Li, X.**; Dai, Z.; Zhang, D.; Wang, X.; Tang, Y.; Lin, L. (2023). Effect of abscisic acid on selenium uptake and growth of *Cyphomandra betacea* Sendt. (*Solanum betaceum* Cav.) seedlings under selenium stress, *International Journal of Phytoremediation*, doi.org/10.1080/15226514.2023.2277800.
- 2023 Lee, J.H.; Lucas, M.; Guber, A.K.; **Li, X.**; Kravchenko, A.N. (2023). Interactions among soil texture, pore structure, and labile carbon influence soil carbon gains. *Geoderma* 439, 116675. doi.org/10.1016/j.geoderma.2023.116675.
- 2023 Shi, J.; Hu, R.; Li, Q; **Li, X.**; Liu, D.; Xiang, Z.; Liao, S.; Yu, H.; Huang, T.; & Li, Y. (2023). Effects of tea application on cadmium, phosphorus, and iron accumulations in rice (*Oryza sativa* L.) seedlings. *Environmental Progress & Sustainable Energy*. EP14313. doi.org/10.1002/ep.14313.
- 2022 **Li, X.**; Petipas, R.H.; Antoch, A.A.; Liu, Y.; Stel, H.V.; Bell-Dereske, L.; Smercina, D.N.; Bekkering, C.; Evans, S.E.; Tiemann, L.K.; & Friesen, M.L. (2022). Switchgrass cropping systems affect soil carbon and nitrogen and microbial diversity and activity on marginal lands. *GCB Bioenergy*, 14(8), 918-940.
- 2022 **Li, X.**; Jiang, J.; Guo, J.; McClung, A.; Chen, K.; Velarca, M.V.; Torbert, H.A.; & Dou, F. (2022). Effect of nitrogen application rate under organic and conventional systems on rice (*Oryza sativa* L.) growth, grain yield, soil properties, and greenhouse gas emissions. *Journal of Plant Nutrition*, 46(8), 1627-1649.
- 2022 Wang, X.; Dou, F.; **Li, X.**; Sun, W.; & Ma, X. (2022). Impact of three copper amendments on arsenic accumulation and speciation in rice (*Oryza sativa* L.) in a life cycle study. *ACS Sustainable Chemistry & Engineering*, 10, 4504-4511.
- 2022 Shi, J.; Lu, J.; **Li, X.**; Xiang, Z.; Liu, D.; Liao, S.; Yu, H.; Zheng, T.; & Huang, T. (2022). Effects of mulching with *Solanum* spp. straw on phosphorus, iron, and cadmium uptake by rice plants. *Environmental Progress & Sustainable Energy*. e13988. doi.org/10.1002/ep.13988.
- 2022 Wang, X.; Jiang, J.; Dou, F.; **Li, X.**; Sun, W.; & Ma, X. (2022). Zinc fertilizers modified the formation and properties of iron plaque and arsenic accumulation in rice (*Oryza sativa* L.) in a life cycle study. *Environmental Science & Technology*, 56, 8209-8220.
- 2022 Wang, X.; Teng, Y.; Wang, X.; **Li, X.**; & Luo, Y. (2022). Microbial diversity drives pyrene dissipation in soil. *Science of the Total Environment*, 819, 153082. doi.org/10.1016/j.scitotenv.2022.153082.
- 2021 **Li, X.**; Tan, A.; Chen, K.; Pan, Y.; Gentry, T.; & Dou, F. (2021). Effect of cover crop type and application rate on soil nitrogen mineralization and availability in organic rice production. *Sustainability*, 13(5), 2866. doi.org/10.3390/su13052866.
- 2021 Wang, X.; **Li, X.**; Dou, F.; Sun, W.; Chen, K.; Wen, Y.; & Ma, X. (2021). Elucidating the impact of three metallic nanoagrichemicals and their bulk and ionic counterparts on the chemical properties of bulk and rhizosphere soils in rice paddies. *Environmental Pollution*, 290, 118005. doi.org/10.1016/j.envpol.2021.118005.
- 2021 Liu, L.; **Li, X.**; Huang, K.; Zhu, Y.; Li, A.; Ao, Q.; Liao, M.; & Lin, L. (2021). Salicylic acid promotes growth and affects cadmium accumulation of *Cyphomandra betacea* seedlings. *Environmental Progress & Sustainable Energy*, EP13787. doi.org/ 10.1002/ep.13787.

- 2021** Wang, Y.; **Li, X.**; Tarpley, L.; Peng, S.; & Dou, F. (2021). Effects of nitrogen management on the ratoon crop yield and head rice yield in south USA. *Journal of Integrative Agriculture*, 20(6), 1457-1464.
- 2021** Wang, X.; Teng, Y.; Ren, W.; Han, Y.; Wang, X.; & **Li, X.** (2021). Soil bacterial diversity and functionality are driven by plant species for enhancing polycyclic aromatic hydrocarbons dissipation in soils. *Science of the Total Environment*, 797, 149204. doi.org/10.1016/j.scitotenv.2021.149204.
- 2020** **Li, X.**; Dou, F.; Guo, J.; Velarca, M.V.; Chen, K.; Gentry, T.J.; & McNear, D. (2020). Soil microbial community responses to nitrogen application in organic and conventional rice (*Oryza sativa* L.) production. *Soil Science Society of America Journal*, 84, 1885-1897.
- 2020** **Li, X.**; Dou, F.; Watkins, K.B.; Wang, S.; Chen, K.; Zhou, X.; McClung, A.; Storlien, J.O.; & Hons, F.M. (2020). Seeding rate effects on organic rice growth, yield, and economic returns. *Agronomy Journal*, 112, 4104-4119.
- 2020** **Li, X.**; Deng, S.; Raun, W.R.; Wang, Y.; & Teng, Y. (2020). Bacterial community in soils following century-long application of organic or inorganic fertilizers under continuous winter wheat cultivation. *Agronomy*, 10(10):1497. doi.org/10.3390/agronomy10101497.
- 2019** Ma, X.; Sun, K.; Dou, F.; **Li, X.**; Wang, X.; & Sun, W. (2019). Impact of elevated nitrate and perchlorate in irrigation water on the uptake, speciation and accumulation of arsenic in rice (*Oryza sativa* L.). *Water, Air, & Soil Pollution*, 231, 309. doi.org/10.1007/s11270-020-04701-z.
- 2018** Dick, R.P.; Dick, K.; Deng, S.P.; **Li, X.**; Kandeler, E.; Poll, C.; Freeman, C.; Jones, T.G.; Weintraub, M.N.; Esseili, K.A.; & Saxena, J. (2018). Cross-laboratory comparison of fluorimetric microplate and colorimetric bench-scale soil enzyme assays. *Soil Biology and Biochemistry*, 121, 240-248.
- 2017** Dou, F.; Ping, C.L.; **Li, X.**; Jorgenson, T.; Guo, L.; Chen, K.; & Michaelson, G. (2017). Soil organic carbon reactivity along the eroding coastline of northern Alaska. *Soil Science*, 182, 227-232.
- 2016** Teng, Y.; **Li, X.**; Chen, T.; Zhang, M.Y.; Wang, X.M.; Li, Z.G.; & Luo, Y.M. (2016). Isolation of the PCB-degrading bacteria *Mesorhizobium* sp. ZY1 and its combined remediation with *Astragalus sinicus* L. for contaminated soil. *International Journal of Phytoremediation*, 18, 141-149.

2. Patent

- 2013** Teng, Y.; **Li, X.**; Luo, Y.M.; & Li, Z.G. 2013. *Mesorhizobium* ZY1 and its application in soil remediation. Issuing Organization: China National Intellectual Property Administration. Assignee: Chinese Academy of Sciences. Patent No. CN102876621B. Accession Number CGMCC No.6622.

3. Popular Press Articles

- 2019** Dou, F.; Samford, J.; Liu, G.; Landry, K.; **Li, X.** 2019. Responses of rice production to nitrogen applied to main crop. *Texas Rice (Special Section, Highlighting Research in 2019)*:28-29.
- 2019** Dou, F.; Samford, J.; Liu, G.; Landry, K.; **Li, X.** 2019. Effects of rice variety on main, ratoon, and total crop yields. *Texas Rice (Special Section, Highlighting Research in 2019)*:26-28.
- 2018** Dou, F.; Samford, J.; Liu, G.; Landry, K.; **Li, X.** 2018. Responses of rice production to nitrogen applied to main crop. *Texas Rice (Special Section, Highlighting Research in 2018)*:20-22.
- 2018** Dou, F.; Samford, J.; Liu, G.; Landry, K.; **Li, X.** 2018. Effects of rice variety on main, ratoon, and total crop yields. *Texas Rice (Special Section, Highlighting Research in 2018)*:17-19.

4. Conference Abstracts and Presentations

- 2024** Li, X.; Evans S.E.; Tiemann L.K.; Friesen M.L. Uncovering the Seasonal Dynamics of Nitrogen-Cycling Gene Abundance in Soils Associated with Switchgrass. Annual ASA-SSSA-CSA Meeting, Nov 10-13, 2024. San Antonio, TX.
- 2024** Dou, F.; Li, X.; Wang, X.; Ma, X.; Sun, W.; and Chen, K. Effectiveness of Nanomaterials and Their Counterparts in Improving Rice Growth and Yield under Arsenic Contamination. The 61st Annual Conferences of The Clay Minerals Society. June 3-6, 2024. Hawaii.
- 2022** Li, X.; Petipas, R.H.; Antoch, A.A.; Liu, Y.; Stel, H.V.; Bell-Dereske, L.; Smercina, D.N.; Evans, S.E.; Tiemann, L.K.; & Friesen, M.L. Switchgrass cropping systems affect soil carbon and nitrogen and microbial diversity and activity on marginal lands. 2022 GLBRC Virtual Sustainability Meeting, Feb 14-16, 2022. Virtual Zoom Meeting.
- 2021** Li, X.; Petipas, R.H.; Antoch, A.A.; Liu, Y.; Stel, H.V.; Bell-Dereske, L.; Smercina, D.N.; Evans, S.E.; Tiemann, L.K.; & Friesen, M.L. Effect of switchgrass cultivation and nitrogen fertilization on soil fertility, microbial richness and diversity, enzyme activity, and plant productivity. Annual ASA-SSSA-CSA Meeting, Nov 7-10, 2021. Salt Lake City, UT.
- 2021** Dou, F.; Li, X.; Guo, J.; Velarca, M.V.; Chen, K.; Gentry, T.; & McNear, D. Soil microbial community responses to nitrogen application in organic rice production. Symposium of Chemistry and the Rice Field Ecosystem, the International Chemical Congress of Pacific Basin Societies. Dec. 16-21, 2021. Honolulu, Hawaii.
- 2020** Lamichhane, S.; Li, X.; Jiang, J.; & Dou, F. Effects of soil moisture on nitrogen loss associated with ammonia volatilization in direct-seeded, delay-flooded rice production. 112th ASA-SSSA-CSA International Virtual Annual Meeting, Nov 9-13, 2020. Virtual Zoom Meeting.
- 2020** Li, X.; Tan, A.; & Dou, F. Responses of soil N supply to the addition of winter cover crop. 38th Rice Technical Working Group Conference, Feb. 24-27, 2020. Orange Beach, AL.
- 2020** Dou, F.; Tu, Q.; Li, X.; & Dong, Z. Effect of soil moisture, nitrogen rate, and urease inhibitor on ammonia volatilization. 38th Rice Technical Working Group Conference, Feb. 24-27, 2020. Orange Beach, AL.
- 2019** Li, X.; Tan, A.; & Dou, F. Effect of cover crop mixing and application rate on soil n mineralization in an incubation study. 111th Annual ASA-SSSA-CSA Meeting, Nov. 10-13, 2019. San Antonio, TX.
- 2019** Dou, F.; Li, X.; & Deng, Y. Effect of Vermiculite Clays on the Performance of Urease Inhibitors in Soil Ammonia Volatilization. International conference on clay science and technology, Jul. 1-5, 2019. Paris, France.
- 2018** Li, X.; Dou, F.; Wang, S.; Chen, K.; Zhou, X.; & McClung, A. Effect of Seeding Rate on Plant Growth, Grain Yield and Yield Components in Organic Rice Production. 37th Rice Technical Working Group Conference, Feb. 19-22, 2018. Long Beach, CA.
- 2018** Li, X.; Dou, F.; Guo, J.; Velarca, M.V.; Chen, K.; Gentry, T.; & McNear, D. Effect of Nitrogen Source and Rate on Soil Microbial Community Structure during Rice Production. 37th Rice Technical Working Group Conference, Feb. 19-22, 2018. Long Beach, CA.
- 2016** Li, X.; & Dou, F. Effect of Seeding Rate on Plant Growth, Grain Yield, Yield Components, Milling Quality and Weed Density of Organic Rice. 108th Annual ASA-SSSA-CSA Meeting, Nov. 6-9, 2016. Phoenix, AZ.
- 2015** Li, X.; Deng, S.; Raun, W.R.; Teng, Y.; & Wang, Y. Dominant Bacterial Phyla in Soils under 18–114 Years of Wheat Cultivation. 107th Annual ASA-SSSA-CSA Meeting, Nov. 15-18, 2015. Minneapolis, MN.

- 2014** Li, X.; Deng, S.; Raun, W.R.; Wang, Y.; & Teng, Y. Unique Bacterial Phyla in Ecosystems that was under Native Vegetation, Conservation Reserve Program, or Continuous Winter Wheat Cultivation. 106th Annual ASA-SSSA-CSA Meeting, Nov. 2-5, **2014**. Long Beach, CA.
- 2013** Collins, J.; Li, X.; Deng, S.; Wang, Y.; & Raun, W.R. Drivers and Dynamics of Nitrogen Mineralization in Soil. 105th Annual ASA-SSSA-CSA Meeting, Nov 3-6, **2013**. Tampa, FL.
- 2013** Li, X.; Deng, S.; Wang, Y.; Raun, W.R.; & Teng, Y. Unique Bacteria in Century-Old Untreated or Manure Treated Wheat Soil Ecosystems. 105th Annual ASA-SSSA-CSA Meeting, Nov 3-6, **2013**. Tampa, FL.

5. Regional/Research-User Presentations

- Li, X.; Mock, C.; Tu, Q.; Zhou, C.; Zhang, H.; Dou, F.; Liu, G.; & Landry, K. 2018 On-farm trials: Effect of phosphorus and potassium fertilization on rice production. Texas A&M AgriLife Beaumont Field Day, July 2019.
- Li, X.; Mock, C.; Tu, Q.; Zhou, C.; Zhang, H.; Dou, F.; Liu, G.; & Landry, K. 2018 On-farm trials: Effect of phosphorus and potassium fertilization on rice production. Texas A&M AgriLife Eagle Lake Field Day, June 2019.
- Dou, F.; Liu, G.; Samford, J.; Li, X.; & Landry, K. 2017 Varietal evaluation, and N application for rice main and ratoon crop yield potential. Texas A&M AgriLife Beaumont Field Day, July 2018.
- Dou, F.; Liu, G.; Samford, J.; Li, X.; & Landry, K. 2017 Varietal evaluation and N application for rice main and ratoon crop yield potential. Texas A&M AgriLife Eagle Lake Field Day, June 2018.
- Li, X.; Dou, F.; Liu, G.; & Landry, K. Effect of variety and nitrogen rate on organic rice grain yield and milling quality. Texas A&M AgriLife Beaumont Field Day, July 2017.
- Li, X.; Dou, F.; Liu, G.; & Landry, K. Effect of variety and nitrogen rate on organic rice grain yield and milling quality. Texas A&M AgriLife Eagle Lake Field Day, June 2017.
- Li, X.; Dou, F.; Liu, G.; & Landry, K. Effect of Seeding Rate on Plant Growth, Grain Yield, Yield Components and Weed Density of Organic Rice. Texas A&M AgriLife Beaumont Field Day, July, 2016.
- Li, X.; Dou, F.; Liu, G.; & Landry, K. Effect of Seeding Rate on Plant Growth, Grain Yield, Yield Components and Weed Density of Organic Rice. Texas A&M AgriLife Eagle Lake Field Day, June, 2016.

STUDENT ADVISING AND MENTORING

- **Graduate student advisor:** 1 PhD and 1 Master's students.
- **Graduate Committee:** 4 PhD and 3 Master's students.
- **Undergraduate student mentor:** 6 undergraduate students.

COURSE TEACHING

- SOIL/BIOL 476 Soil Microbiology (3 credits), graduate and undergraduate course
- SOIL/BIOL 476L Soil Microbiology Lab (1 credit), graduate and undergraduate course
- PLEN 512L Soil Health & Fertility Lab (1-2 credits, In Development), graduate and undergraduate course

SERVICE AND OUTREACH

- 1. Invited Grant Panelist & Reviewer**

- **Sep-Nov, 2024:** Invited grant-review panelist for the USDA NIFA A1102 “Foundational Knowledge of Agricultural Production Systems” program.

2. Invited Journal Guest Editor

- *Land*, Special Issue: Promoting Soil Health for Sustainable Agricultural and Bioenergy Production, Feb 2023-Feb 2024.
- *Agronomy*, Special Issue: Soil Nutrient Cycling and Management of Agronomy, Mar 2021- Mar 2022.

3. Invited Journal Reviewer (17 journals)

Science of the Total Environment, Biology, Scientific Reports, Plants, Ecosystem Health and Sustainability, Agronomy, Land, Sustainability, Life, Applied Sciences, International Journal of Environmental Analytical Chemistry, Processes, Agronomy Journal, Environmental Progress & Sustainable Energy, Environmental Monitoring and Assessment, HortScience, Horticulturae.

4. Department Services

- **Dec 2023 – Oct 2024:** Serve on the search committee for the “Plant Genetics & Crop Breeding” tenure-track assistant professor position, Department of Plant and Environmental Sciences, NMSU.
- **Jan 2022 – Aug 2023:** Serve on the Department Diversity, Equity, and Inclusive (DEI) Committee, Department of Plant Pathology, Washington State University.
- **2023:** Serve on the search committee for the “Graduate Research Technician” position in Friesen Lab, Jan-Mar, 2023, Washington State University, Pullman, WA.
- **2019:** Tour guide for Texas A&M AgriLife Research Center Beaumont Field Day. Jul 2019. Beaumont, TX.

5. College Services

- **2024:** Judge for NMSU ACES College OPEN “Graduate Student Poster Competition”. Apr 4-6, 2024, NMSU.

6. University Services

- **Nov 2024 – present:** Serve on the NMSU Graduate Faculty Council as one of the two ACES College Representatives.
- **Apr 2024:** Judge for “Graduate Student Oral Competition” and “Graduate Student Poster Competition”, NMSU Department of Biology Annual “Spring Biosymposium”, Apr 20, 2024, NMSU.
- **2022:** Serve on the search committee for “Postdoctoral Research Associate” position, Paulitz Lab, USDA. Nov 2021-Feb, 2022.
- **2019:** Invited guest speaker for Bernard Harris ExxonMobil Lamar University Summer Science Camp. Jun 14, 2019.
- **2018:** Invited guest speaker for Bernard Harris ExxonMobil Lamar University Summer Science Camp. Jun 14, 2018.
- **2017:** Invited guest speaker for ExxonMobil Bernard Harris Lamar University Summer Science Camp. Jun 15, 2017.

7. Professional Community Services

- **2023:** Outreach meeting with the NMDA Healthy Soil Program Team, Oct 24, 2023, Las Cruces, NM.
- **2023:** Outreach meeting with the Olam Food Ingredients Company, Dec 4, 2023, Las Cruces, NM.
- **2019:** Graduate student poster competition judge. Soil Fertility, Plant Nutrition, and Soil/Plant Analysis Section. 111th Annual ASA-SSSA-CSA Meeting, Nov 10-13, 2019. San Antonio, TX.
- **2018:** Graduate student poster competition judge. 37th Rice Technical Working Group Conference, Feb 19-22, 2018. Long Beach, CA.

8. Public Education Services

- **2017:** Educational exhibitor for the 48th Texas Rice Festival. Oct 6, 2017. Winnie, TX.
- **2016:** Educational exhibitor for the 47th Texas Rice Festival. Oct 1, 2016. Winnie, TX.