

**Faranak Ranjbar**

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- <https://scholar.google.com/citations?user=f5GwDV4AAAAJ&hl=en>

**Education**

Bu-Ali Sina University, Hamedan, Iran

- Ph.D. in Soil Chemistry and Fertility, September 2010-October 2015 (GPA: 19.01/20), Ranked 1st in class
- Thesis: The short-term and long-term modeling of solute status in surface soils under different cultivations in presence of clay adsorbents and nanoparticles
- Supervisor: Prof. Mohsen Jalali
- M.Sc. in Soil Chemistry and Fertility, September 2006-October 2008 (GPA: 18.19/20), Ranked 1st in class
- Thesis: Effect of plant residues on reducing soil sodicity due to the application of sodic waters
- Supervisor: Prof. Mohsen Jalali
- B.Sc. in Soil Science, September 1998-November 2002

**Research Interests**

- Geochemical modeling of movement and transport of solutes and pollutants in soil profiles in order to maintain and improve the quality of the environment.
- Long-term simulation of changes in soil chemical properties under different management scenarios using geochemical modeling.
- Bioremediation of salt- and sodium-affected and heavy metal-polluted soils
- Advanced studies in plant nutrition and soil chemistry, fertility, and pollution in order to improve soil management in sustainable agriculture.
- Assessment of water quality in agriculture and providing the guidelines for using waters of different qualities in various parts of the world.
- Treatment of waters and wastewaters polluted with soluble salts and heavy metals using nanobiotechnology.

**Honors and Awards**

Bu-Ali Sina University, Hamedan, Iran

- Won the best master student award in the College of Agriculture, 2003
- Won the best Ph.D. student award in the College of Agriculture, 2012
- Won the best researcher award among Ph.D. students in the College of Agriculture, 2015

**Work Experience**

1. Agricultural Organization, Kermanshah, Iran

- Technical Supervisor of Wheat Fields, December 2002-September 2006
- 2. Department of Soil Science, College of Agriculture, Bu-Ali Sina University, Hamedan, Iran
  - Research Assistant, December 2008-September 2009
    - Transformation of inorganic phosphorus in calcareous soils over time
    - Effect of addition of organic residues on phosphorous release kinetics in some calcareous soils of Hamedan
    - Mineralization of nitrogen, phosphorous, and sulfur over time at different depths of soil profiles
- 3. Department of Soil Science, College of Agriculture, Bu-Ali Sina University, Hamedan, Iran
  - Teaching Assistant, September 2012-January 2013
    - Plant Nutrition (lab) to undergraduates
- 4. Department of Soil Science, College of Agriculture, Razi University, Kermanshah, Iran
  - Lecturer, February 2016-September 2018
  - Assistant Professor, September 2018-Present
    - General Soil Science (theory and lab) to undergraduates
    - Specialized Skills for Soil Science Students (lab) to undergraduates
    - General Biology (theory) to undergraduates
    - Soil Pollution (theory and lab) to undergraduates
    - Soil Management in Sustainable Agriculture (theory) to undergraduates
    - Soil Fertility (theory and lab) to undergraduates
    - Soil Chemistry (theory and lab) to undergraduates
    - Soil, Water, and Plant Interactions (lab) to undergraduates
    - Saline and Sodic Soils (theory and lab) to undergraduates
    - Advanced Soil fertility (theory and lab) to graduates

### **Publications**

1. Rates of decomposition and phosphorus release from organic residues related to residue composition. 2009. *Journal of Plant Nutrition and Soil Science*, 172: 353-359.
2. Effects of sodic water on soil sodicity and nutrient leaching in poultry and sheep manure amended soils. 2009. *Geoderma*, 153: 194-204.
3. Aging effects on phosphorus transformation rate and fractionation in some calcareous soils. 2010. *Geoderma*, 155: 101-106.
4. Effects of plant residues and calcite amendments on soil sodicity. 2011. *Journal of Plant Nutrition and Soil Science*, 174: 874-883.
5. Effect of addition of organic residues on phosphorus release kinetics in some calcareous soils of western Iran. 2011. *Environmental Earth Sciences*, 62: 1143-1150.
6. Calcium, Magnesium, Sodium, and Potassium Release during Decomposition of Some Organic Residues. 2012. *Communications in Soil Science and Plant Analysis*, 43: 645-659.
7. Transformation kinetics of inorganic P forms in relation to calcareous soil properties of western Iran. 2013. *Archives of Agronomy and Soil Science*, 59: 353-366.

8. Measuring and modeling ammonium adsorption by calcareous soils. 2013. *Environmental Monitoring and Assessment*, 185: 3191-3199.
9. Release kinetics and distribution of boron in different fractions in some calcareous soils. 2013. *Environmental Earth Sciences*, 70: 1169-1177.
10. Empirical and mechanistic evaluation of  $\text{NH}_4^+$  release kinetic in calcareous soils. 2014. *Archives of Environmental Contamination and Toxicology*, 66: 606-615.
11. Surface Complexation model of boron adsorption by calcareous soils. 2014. *International journal of Environmental Science and Technology*, 11: 1317-1326.
12. Nitrogen, phosphorus and sulfur mineralization as affected by soil depth in rangeland ecosystems. 2014. *Environmental Earth Sciences*, 72: 1775-1788.
13. The effect of chemical and organic amendments on sodium exchange equilibria in a calcareous sodic soil. 2015. *Environmental Monitoring and Assessment*, 187: 683-703.
14. The removal of boron from aqueous solutions using natural and chemically modified sorbents. 2016. *Desalination and Water Treatment*, 57: 8278-8288.
15. The combination of geostatistics and geochemical simulations for the site-specific management of soil salinity and sodicity. 2016. *Computers and Electronics in Agriculture*, 121: 301-312.
16. Empirical and mechanistic evaluation of sodium exchange isotherms on natural mineral and organic adsorbents and organically-functionalized nanoparticles. 2016. *International Journal of Environmental Science and Technology*, 13: 1891-1916.
17. Long-term simulation of some soil chemical properties under continuous wheat cultivation irrigated with waters of different qualities. 2019. *International Journal of Environmental Science and Technology*, 16: 3249-3264.
18. Selectivity coefficients of K, Na, Ca, and Mg in binary exchange systems in some calcareous soils. 2020. *Environmental Monitoring and Assessment*, 192(2): 80.
19. Changes in some chemical properties of saline-sodic soils over time as affected by organic residues: An incubation study. 2020. *Polish Journal of Soil Science*, 53(1): 1-20.
20. Comparison of *Myagrurn perfoliatum* and *Sophora alopecuroides* in phytoremediation of Cd- and Pb-contaminated soils: A chemical and biological investigation. 2020. *Chemosphere*, 259: 127450.
21. Comparison of different chemical agents in the single extraction of some potentially toxic elements (PTEs) from contaminated soils. 2022. *Environmental Earth Sciences*, 81: 282.
22. Release kinetics of carbon, nitrogen, phosphorus, and potassium during co-composting of poultry manure mixed with different ratios of wheat straw and zeolite. 2023. *Waste and Biomass Valorization*, 14: 57-68.
23. Empirical and mechanistic modeling of release kinetics of heavy metals and their chemical distribution in the rhizosphere and non-rhizosphere soils under vegetable cultivation. 2023. *Archives of Environmental Contamination and Toxicology*, 84(4): 466-483.
24. Selectivity and adsorption of potassium by bentonites saturated with calcium, magnesium and sodium. 2023. *Water and Soil*, 37(1): 113-127. (In Persian)

25. Impact of different co-composted poultry manures on the chemical and biological quality of the calcareous soil. 2023. *International Journal of Environmental Science and Technology*, 20: 12041-12052.
26. Automatic detection and counting of *Tuta absoluta* (Myrick) using deep learning technique. 2024. *Applied Entomology and Phytopathology*, 91(2): 149-156. (In Persian)
27. Impacts of different amendments and water qualities on soluble and exchangeable phases and hydraulic conductivity of a calcareous soil. 2024. *International Journal of Environmental Research*, 18(3): 46.
28. Effect of biochr and humic acid on reducing alkalinity stress in basil (*Ocimum basilicum* L.). 2024. *Iranian Journal of Soil and Water Research*, 55(7): 1113-1127. (In Persian)
29. Improvement of iron chlorosis and nutrient balance in peach and nectarine trees under the integrated fertilization management using DOP, DRIS, and CND methods. 2024. *Scientia Horticulturae*, 338: 113697.
30. The effect of humic acid and Na- and Ca-zeolites on potassium adsorption isotherms in a loamy soil. 2024. *Applied Soil Research*, 12(3): 33-46 (In Persian).
31. Effect of integrated deep-hole fertilization management on some soil chemical and biological properties. 2024. *Journal of Soil Management and Sustainable Production*, 14(3): 77-98. (In Persian)
32. Investigating the quantity-intensity (Q/I) parameters of potassium in the soil affected by the addition of minerals and humic acid. 2025. *Iranian Journal of Soil and Water Research*, 55(11): 2075-2090. (In Persian).
33. Effect of Sulfur and Thiobacillus Application on Potato Yield and Common Scab Disease Suppression under the Field Condition. 2025. *Plant Protection*, 47(4), 77-91. (In Persian)
34. The effect of 24-epibrassinolide on chlorophyll parameters, physiological and biochemical traits of lettuce (*Lactuca sativa* L.) under salt stress. 2025. *Crop Biotechnology*, 14(4): 57-68. (In Persian).
35. Impacts of humic acid and zinc sulfate application on yield, yield components, and uptake of nutrients in rainfed chickpea (*Cicer arietinum* L. cv. Mansour). 2026. *Journal of Soil and Plant Interactions*, In press. (In Persian).
36. Exploring the interactions between irrigation water quality, soil properties, and saturated hydraulic conductivity in semi-arid soils. 2026. *International Journal of Environmental Science and Technology*, In press.

### **Conferences**

1. Effect of chemical and organic amendments on soil sodicity process caused by using sodic waters. 11<sup>th</sup> Iranian Soil Science Congress, 12-14 July 2009, Gorgan, Iran. (Oral)
2. Effect of irrigation with waters having different SAR values on the leaching of nutrients from soil. 11<sup>th</sup> Iranian Soil Science Congress, 12-14 July 2009, Gorgan, Iran. (Poster)
3. Effect of organic residues and time on phosphorous transformation in some calcareous soils of Hamedan, 12<sup>th</sup> Iranian Soil Science Congress, 3-5 September 2011, Tabriz, Iran. (Poster)

4. Evaluation of the effect of ionic strength on adsorption isotherms and leaching of boron in some calcareous soil. 13<sup>th</sup> Iranian Soil Science Congress, 28-30 January 2014, Ahvaz, Iran. (Poster)
5. Measurement and 1D transport modeling of boron movement in some calcareous soils affected by different ionic strengths. 20<sup>th</sup> World Congress of Soil Science, 8-13 June 2014, Jeju, Korea. (Poster)
6. Evaluating the ability of mechanistic cation exchange model to simulate potassium adsorption isotherms on mineral adsorbents using PHREEQC. 14<sup>th</sup> Iranian Soil Science Congress, 28-30 August 2017, Isfahan, Iran. (Oral)
7. Evaluating the effect of functionalized metal oxide nanoparticles on the reclamation of a sodic soil in an open system. 8<sup>th</sup> National Seminar of Chemistry and Environment of Iran, 6-7 September 2017, Karaj, Iran. (Oral)
8. Phytoremediation of Cd-contaminated soil by muskweed (*Myagrurn perfoliatum*). 10<sup>th</sup> National Conference on Sustainable Environment, Energy, and Natural Resources, 7 July 2020, Tehran, Iran. (Poster)
9. Phosphorus release kinetics from soil as affected by different fertilizer treatments. 10<sup>th</sup> National Conference on Sustainable Environment, Energy, and Natural Resources, 7 July 2020, Tehran, Iran. (Poster)
10. The effect of different proportions of poultry manure and wheat straw and the use of zeolite on some chemical characteristics of compost. 2<sup>nd</sup> National Conference on Agricultural Industry and Commercialization, 12 May 2021, Ahvaz, Iran. (Poster)
11. An overview of the problems of salt-affected soils and their management. 1<sup>st</sup> National Conference on Environment Challenges and Real World Solution. 25 August 2021, Gorgan, Iran. (Poster)
12. The effect of muskweed (*Myagrurn perfoliatum*) on some biological indicators in Cd-and Pb-contaminated soils. 17<sup>th</sup> Iranian Soil Science Congress and the 4<sup>th</sup> National Conference on Water Management in the Farm. 18-20 October 2021, Karaj, Iran. (Oral)
13. Effect of application of four poultry manure composts on some soil biological indicators. 1<sup>st</sup> National Conference on Green Management in the Third Millennium (Experiences, Challenges, and Solutions). 8 June 2022, Birjand, Iran. (Poster)
14. Impacts of organic compounds and water quality on changing the solution and exchangeable phases of soil. 2<sup>nd</sup> National Conference on Green Waste Management. 12-13 September 2022, Ardabil, Iran. (Poster)
15. Investigating parameters affecting selectivity coefficients of potassium in zeolite in the binary system. 4<sup>th</sup> National Congress on Development and Promotion of Agricultural Engineering and Soil Sciences of Iran. 27 November 2022, Tehran, Iran. (Poster)
16. Investigating the effect of biochar on reducing salinity stress in medicinal plants. 3<sup>rd</sup> National Conference on Agricultural Development, Healthy Earth. 11 March 2023, Tehran, Iran. (Poster)

17. A review of the methods to remove chlorosis caused by iron in fruit trees. 3<sup>rd</sup> National Conference on Agricultural Development, Healthy Earth. 11 March 2023, Tehran, Iran. (Poster)

### **Supervision of Thesis**

1. Effect of carbon nanodots as a slow-release fertilizer on iron and zinc uptake by corn (*Zea mays* L.). In process.  
Evaluating the spatial variability of soil compaction in central Mahidasht, Kermanshah. In process.  
Impacts of humic acid and zinc on yield and yield components of autumn-sown chickpea (*Cicer arietinum* L. cv. *Mansour*).
2. Health Risks of Heavy Metals in Soil, Water, and Edible Organs of Some Crops in Lorestan Province.
3. The effects of biochar and humic acid on reducing alkalinity stress in basil (*Ocimum basilicum* L.).
4. Comparison of combined applications of different types of fertilizers in the correction of iron chlorosis in fruit trees.
5. Effect of some soil physical and chemical properties and irrigation water quality on the saturated hydraulic conductivity.
6. Effect of some organic and inorganic amendments and irrigation water quality on saturated hydraulic conductivity of a medium-textured soil.
7. Study of application of mineral particles and humic acid on the selectivity and quantity-intensity (Q/I) parameters of potassium in a light-textured soil.
8. Composting of poultry manure with zeolite and wheat straw followed by investigating some biological indices and chemical properties in a compost-amended soil.
9. Evaluation of the effectiveness *Sophora alopecuroides* and *Myagrurn perfoliatum* in phytoremediation of Pb- and Cd-contaminated soils.

### **Research Project**

1. Evaluation of nutritional balance in peach and nectarine trees of a varieties-collection orchard focusing on the correction of iron chlorosis. 2020-2023. This project was performed with the financial support of the Research and Technology Vice-Chancellor at Razi University.
2. Nutritional monitoring of apple, grape, and peach orchards to increase the quantity and quality of products in Kermanshah province. 2024-In process. This project has a contract with the Agricultural Jihad Organization of Kermanshah Province.
3. Evaluating spatial variability of soil compaction in Mahidasht and providing solutions for improving the lands and increasing production. 2024-In process. This project has a contract with the Agricultural Jihad Organization of Kermanshah Province.
4. Meta-analysis of scientific findings and field investigation of the causes of low yield of chickpeas in Kermanshah province and proposal approaches. 2024-In process. This project has a contract with the Agricultural Jihad Organization of Kermanshah Province.

5. Synthesis of slow-release enriched urea fertilizer by method of superabsorbent composites based on using wheat bran, municipal waste compost, starch, zeolite, and bentonite. 2025-In process. This project has a contract with Iran National Elites Foundation.

6. Assessment and zonation of factors affecting the accessibility and uptake of <sup>226</sup>-radium by dominant agricultural and non-agricultural plants in radium-contaminated soils in the Ramsar region. 2025-In process.

### **Professional Contributions**

Reviewer in peer-reviewed Journals including Ecological Indicators (Elsevier), Archives of Agronomy and Soil Science (Taylor and Francis), Environmental Earth Sciences (Springer), and Geochemical Exploration (Elsevier), Environmental Progress and Sustainable Energy (John Wiley & Sons), Soil Research (CSIRO), ...

### **Technical Skills**

- Well-experienced in using specific software programs, e.g. Microsoft Office, PHREEQC, Visual Minteq, SPSS, SAS, GIS, GS+.
- Well-skilled in writing and editing scientific papers for being published in specialized journals.