# Dr. Zain Mushtaq

| | |
|---|---|
| Father name | Mushtaq Ahmad |
| Date of birth | 03-07-1992 |
| CNIC no. | 32203-2264471-9 |
| Domicile | Punjab |
| Marital status | Single |
| Nationality | Pakistani |
| Postal address | Munawar Hussain, 199 B1, Johar Town, Lahore, Pakistan |
| Cell no. | +92-347-7434786 |
| Email-address | zmushtaq60@gmail.com/ zain.ss@pu.edu.pk |
| ORCID | https://orcid.org/0000-0002-5588-8858 |


## Academic Qualification

| Degree title | Subject | University/Board | Passing year | Marks/CGPA | Division | Percent Age |
|---|---|---|---|---|---|---|
| Ph.D. Agriculture | Soil & Environmental Microbiology | University of Agriculture, Faisalabad Pakistan | 2021 | - | - | - |
| M. Sc. (Hons) Agriculture | Soil Science | University of Agriculture, Faisalabad Pakistan | 2017 | 3.87/4.00 | 1ST | 80.85% |
| B. Sc. (Hons) Agriculture | Soil Science | University of Agriculture, Faisalabad Pakistan | 2015 | 3.64/4.00 | 1ST | 78.21% |
| F. Sc. | Pre-medical | B.I.S.E., D.G. KHAN, Pakistan | 2010 | 905/1100 | 1ST | 82.27% |
| Matriculation | Science | B.I.S.E., D.G. KHAN, Pakistan | 2008 | 768/850 | 1ST | 90.35% |

## Experience

1) **Assistant Professor** at Department of Soil Science, Faculty of Agricultural Sciences, University of the Punjab from 11 July 2023 to till date.
2) **Assistant Superintendent** at Boys Hostel 18, University of the Punjab from 24 July 2023 to till date.
3) **Visiting Assistant Professor** at Department of Soil Science, University of the Punjab from 01 September 2021 to 10 July 2023.
4) One-year experience as **Research Fellow** in HEC Funded research project entitled "Synergistic use of plants and microbes to improve health of lead contaminated soils" run by Prof. Dr. Hafiz Naeem Asghar in the Institute of Soil and Environmental Sciences, University of agriculture, Faisalabad.
5) Six months **Teaching Assistantship** at Institute of Soil and Environmental Sciences, University of Agriculture, Faisalabad.
6) One-year experience as **President** of Soil and Environmental Sciences Students Society Regd. at Institute of soil and environmental sciences, University of agriculture, Faisalabad.
7) Four months **Internship** at Soil Chemistry Section, Ayyub Agricultural Research Institute, Faisalabad, Pakistan.

## Research Projects

1. **Principle Investigator** of Punjab University Funded research project entitled "Impact assessment of pre-isolated iron solubilizing rhizobacteria and auxin on iron content in Spinach". (2024-2025). Rs. 0.2 million
2. **Research Officer** of HEC Funded Research Project entitled "Synergistic use of plant and microbes to improve plant growth under lead contaminated soil"

## Distinction

1. Ph.D. Indigenous scholarship under HEC, Ph.D. Fellowship Program for 5000 scholars, Phase II Batch-v.
2. First division throughout the carrier
3. First Position in school in matriculation

## Publications (IF: 100.848)

**(a). Research papers**

1. Ali A, Ferdosi FH, Sarwar M, Anjum S, Mushtaq Z, Liaquat M, Abbas MT, Anees M, Tariq MR, Ashraf MI, Alasmari A, Mondol MSA and Abdi G (2025) Inducing salt stress tolerance in bitter gourd (*Momordica chanrantia*) through seed treatment with chitosan. *Front. Plant Sci.* 15:1525561. doi: 10.3389/fpls.2024.1525561. **(IF: 4.1)**
2. Anjum, S., Ain, Q.U., Sarwar, M., Alam, M.W., **Mushtaq, Z**., Mukhtar, A., Ashraf, M.I. and Alasmari, A., 2025. Chitosan Induced Modification in Morpho-Physiological, Biochemical and Yield Attributes of Pea (Pisum Sativum L.) Under Salt Stress. *Journal of Soil Science and Plant Nutrition*, pp.1-11. https://doi.org/10.1007/s42729-024-02202-0. **(IF: 3.4)**
3. Saeed, L., Ali, Q., Aon, M., Ahmad, I., Abbas, G., **Mushtaq, Z**., … Zahir, Z. A. (2025). Combined application of rhizobacteria, organic and inorganic amendments reduce lead and cadmium uptake and improve growth of chickpea by modulating physiology and antioxidant status. International Journal of Phytoremediation, 1–13. https://doi.org/10.1080/15226514.2024.2444483. **(IF: 3.4)**
4. Jaffar, MT., S, Zhen., J, Han., J. Zhang., Dar, A., **Mushtaq, Z.,** Hussain, Q., Zahir, A.Z. and Kadambot H.M. Siddique. 2024. Orange peel biochar: An effective amendment to improve the maize resilience by regulating the soil enzymatic activities, nutrient uptake, and ionic homeostasis under salinity stress, Industrial Crops and Products. https://doi.org/10.1016/j.indcrop.2024.120081. **(IF: 5.6)**
5. Ilić, P., Ilić, S., Rashid, A., **Mushtaq, Z.,** Kurilić, S.M., Bjelić, L.S., Markić, D.N., Farooqi, Z,R., Baloch, M.U.J., Mehmood, T., Ullah, Z and Riaz, S. (2024). Exposure Levels, Health Risks, Spatially Distribution, Multivariate Statistics and Positive Matrix Factorization Model of Heavy Metals from Wild solid Waste Dumpsites. Water Air Soil Pollut 235, 648.. https://doi.org/10.1007/s11270-024-07441-6. **(IF: 3.8)**
6. **Mushtaq**, Z., Liaquat, M., Jehan, S. *et al.* Microbial Biofortification of Iron in *Solanum tuberosum* L. through Siderophore-Producing Rhizobacteria along with L-Tryptophan and Iron Sulphate Supply. *Potato Res.* (2024). https://doi.org/10.1007/s11540-024-09785-2. **(IF: 2.3).**
7. **Mushtaq, Z.,** Alasmari, A., Demir, C., Mükerrem, A.O., Bellitürk, K and Baran, M.F. 2024. Enhancing Iron Content in Potatoes: a Critical Strategy for Combating Nutritional

Deficiencies. Potato Research. **(IF: 2.3).**

8. Jaffar, M.T., Chang, W., Zhang, J., Mukhtar, A., **Mushtaq, Z**., Ahmed, M., Zahir, Z.A. and Siddique, K.H., 2024. Sugarcane bagasse biochar boosts maize growth and yield in salt-affected soil by improving soil enzymatic activities. Journal of Environmental Management, 363, p.121418. **(IF: 8.7)**
9. Ilić, P., Ilić, S., **Mushtaq, Z**., Rashid, A., Bjelić, L.S., Markić, D.N., Kurilić, S.M., Farooqi, Z.U.R., Baloch, M.J., Mehmood, T. and Ullah, Z., 2024. Assessing the Ecological Risks and Spatial Distribution of Heavy Metal Contamination at Solid Waste Dumpsites. Eurasian Soil Science, pp.1-20. **(IF: 1.4)**
10. Baloch, S.B., Ali, S., Bernas, J., Moudrý, J., Konvalina, P., **Mushtaq, Z**., Murindangabo, Y.T., Onyebuchi, E.F., Baloch, F.B., Ahmad, M. and Saeed, Q., 2024. Wood ash application for crop production, amelioration of soil acidity and contaminated environments. *Chemosphere*, p.141865. https://doi.org/10.1016/j.chemosphere.2024.141865 **(IF: 8.8)**
11. Rahman, S.U., Zain, M., Qin, A., **Mushtaq, Z**., Ijaz, M., Mehmood, F., Riaz, L., Ali Khan, K. and Shehzad, M., Pb Uptake, Accumulation, and Translocation in Plants: Plant Physiological, Biochemical, and Molecular Response: A Review. *Accumulation, and Translocation in Plants: Plant Physiological, Biochemical, and Molecular Response: A Review*. https://doi.org/10.1016/j.heliyon.2024.e27724 **(IF: 4)**
12. Zubair Aslam, Ali Ahmad, **Zain Mushtaq**, Mehwish Liaquat, Tanveer Hussain, Korkmaz Bellit ürk, Tahani Awad Alahmadi, Mohammad Javed Ansari, Shafeeq Ur Rahman & Zhenjie Du (2024). Evaluating the integration of vermicompost with synthetic fertilizer and compost on mung bean (*Vigna radiata* L.), Archives of Agronomy and Soil Science, DOI: 10.1080/03650340.2023.2301338 **(IF: 2.3)**
13. M. Tauseef Jafar., **Z. Mushtaq**., A. Waheed., H.N. Asghar., J. Zhang and J. Han. *Pseudomonas fuorescens* and L-tryptophan application triggered the phytoremediation potential of sunfower (*Heliantus annuus* L.) in lead-contaminated soil. (2023) Environmental Science and Pollution Research. https://doi.org/10.1007/s11356-023-30839-4. **(IF: 5.9)**
14. Hussain. A., N. Itart., A. Nazir., S. Arif, **Z. Mushtaq.**, I. Khalid., M.A. Albalawi., F.S. Alatawi., M.S. Alatawi., A. Alasmari and A.M.E. Omran. (2023). Exploring the physico-chemical and anti- diabetic potential of *Chenopodium quinoa* (quinoa seeds) among human subjects. Journal of Population Therapeutics and Clinical Pharmacology, *30*(18), 1568–1576. https://doi.org/10.53555/jptcp.v30i18.3288. **(IF: 2.2)**
15. **Mushtaq, Z.**, I. Ashkar., M. Habib-ur-Rahman, A. Sabagh and Predrag Ilić6. 2023. Biofortifcation of Iron in Potato Through Rhizobacteria and Plant Growth Regulator. Potato Research https://doi.org/10.1007/s11540-023-09667-z. **(IF: 2.9)**
16. Ahmad, A., **Mushtaq, Z.,** Nazir, A., Jaffar, M.T., Asghar, H.N., Alzuaibr, F.M., Alasmari, A. and Alqurashi, M., 2023. Growth response of cowpea (*Vigna unguiculata* L.) exposed to Pseudomonas fluorescens, Pseudomonas stutzeri, and Pseudomonas gessardii in lead contaminated soil. Plant Stress, p.100259. **(IF: 5)**
17. **Mushtaq, Z**., Akhter, A., Khan, H.A.A., Anwar, W., Hashem, A., Avila-Quezada, G.D. and Abd_Allah, E.F., 2023. Impact Assessment of Lead-Tolerant Rhizobacteria to Improve Soil Health Using Indian Mustard (*Brassica juncea*) as an Indicator Plant. Plants, 12(16),

p.3005. **(IF: 4.5)**

18. **Mushtaq, Z**., A. Nazir and M.T. Jaffar. 2023. Iron biofortification: a much-needed strategy for prevailing conditions of micronutrient malnutrition. EQA - International Journal of Environmental Quality ISSN 2281-4485. 42 (2023): 36-41. https://doi.org/10.6092/issn.2281-4485/17111. **(IF: 0.7)**

19. Saeed, A., Abbas, M.T., Khan, H.A.A., Anwar, W., **Mushtaq, Z**., Anjum, T. and Akhter, A., 2023. Impact of rice straw biochar in association with inorganic fertilizers and Trichoderma harzianum on charcoal rot (Macrophomina phaseolina) of maize. *World Journal of Biology and Biotechnology*, *8*(3), pp.35-42.

20. Qasim, A., Nazir, A., Itrat, N., Khalid, I., Virk, T.A., Rahim, M.A., **Mushtaq, Z**. and Khan, M.A., 2023. Utilization of Date Pulp and Pit Powder to make Decaf Coffee to Improve Cognitive Health. Journal of Plant and Environment, 5(1), pp.37-50. DOI: 10.33687/jpe.005.01.4418

21. Rasheed, A., Itrat, N., Nazir, A., Zafar, M.U., **Mushtaq, Z**., Ismail, H., Tariq, M.M. and Iftikhar, A., 2023. Analyzing The Therapeutic Effects of Sandalwood Powder (Santalum Album) In Management Of Hypercholesterolemic Patients: An Experimental Trail. Journal of Pharmaceutical Negative Results, pp.748-755.

22. F. Ahmad, **Z. Mushtaq**, W. Anwar, A. Nazir, A. Akhtar, M. Liaquat, M.T. Jaffar, A. Chaudhry, I. Saeed, & H.A.A. Khan. (2023). Impact of siderophore producing rhizobacteria on growth and iron content in potato. *Pakistan Journal of Science*, *75*(02), 338–344. https://doi.org/10.57041/pjs.v75i02.876.

23. **Mushtaq, Z**., Liaquat, M., Nazir, A., Liaqat, R., Iftikhar, H., Anwar, W. and Itrat, N., 2022. Potential of plant growth promoting rhizobacteria to mitigate chromium contamination. *Environmental Technology & Innovation*, p.102826. https://doi.org/10.1016/j.eti.2022.102826. **(IF: 7.548).**

24. **Mushtaq, Z**., H.N. Asghar, Z.A. Zahir and M. Maqsood. 2021. The Interactive Approach of Rhizobacteria and l-tryptophan on Growth, Physiology, Tuber Characteristics, and Iron Concentration of Potato (Solanum tuberosum L.). Journal of Plant Growth Regulation. https://doi.org/10.1007/s00344-021-10395-2. **(IF: 4.64).**

25. **Mushtaq, Z**., H.N. Asghar and Z.A. Zahir, 2021. Comparative growth analysis of okra (Abelmoschus esculentus) in the presence of PGPR and press mud in chromium contaminated soil, Chemosphere. https://doi.org/10.1016/j.chemosphere.2020.127865 **(IF: 8.943).**

26. **Mushtaq, Z.,** Nazir, A., Asghar, H.N. 2022. Interactive Effect of Siderophore-Producing Bacteria and L-Tryptophan on Physiology, Tuber Characteristics, Yield, and Iron Concentration of Potato. *Potato Res.* https://doi.org/10.1007/s11540-022-09565-w. **(IF: 2.90).**

27. **Mushtaq, Z**., Anwar, W., Zohaib, K.A., Akhter, A. and Ahmad, F., 2022. Interaction Between Mycorrhizae and Organic Amendments to Improve Growth and Phosphorus Uptake in Brinjal. Plant Protection, 6(3), pp.233-238.

https://doi.org/10.33804/pp.006.03.4277

28. **Mushtaq, Z**., H.N. Asghar, Z.A. Zahir and M. Maqsood. 2021. Characterization of rhizobacteria for growth promoting traits and their potential to increase potato yield. Pak. J. Agri. Sci., Vol. 58(1): 61-67. DOI:10.21162/PAKJAS/21.1024. **(IF: 0.856).**

29. **Mushtaq, Z**., 2020. Present role, mechanism of action and future prospects along bottlenecks in commercialization. International Journal of Environmental Quality, 41: 9-15. https://doi.org/10.6092/issn.2281-4485/11103. **(IF: 0.7)**

30. **Mushtaq, Z** and A. Nazir. 2021. Biofortification: way forward toward micronutrient deficiency. EQA - International Journal of Environmental Quality ISSN 2281-4485. 42 (2021): 36-41. https://doi.org/10.6092/issn.2281-4485/11598. **(IF: 0.7)**

31. Faiza, S., Hafiz, N.A., **Zain, M**., Amina, H., Naqshe, Z., Rizwan, A. and Muhammad, A.A., 2020. Role of endomycorrhizae, rhizobacteria and compost to improve phosphorus availability in onion. Asian Journal of Agriculture and Biology, 8(2): 194-200. 10.35495/ajab.2019.12.553. **(IF: 2.2)**

32. Itrat, N., Nazir, A., Ali, M., Ahmad, U. and **Mushtaq, Z**. 2021. Acquisition of Hordeum vulgare (Beverage) prospective against adiposity among female trial. Pure and Applied Biology. 11(3): 755-761.

33. Nazir, A., Itrat, N., Saleem, M.A., Nisa, M.U., Shahid, A., **Mushtaq, Z.** and Rafey, H.A., 2021. Functional Foods as the Prospective Therapeutic Option in Chronic Diseases. A Systemic Review. *Journal of Plant and Environment*, *3*(2): 159-169.

34. Shafiq. M., Zaka., **Mushtaq. Z**., Ahmad. F., Anwar. W and A. Akhtar. Prevalence of *Aspergillus* species in Covid-19 patients: A survey study". Biological and Clinical Sciences Research Journal. 2022

### (b). Books Edited

1. SUNDARI, R.S., BELLİTÜRK, K., **MUSHTAQ, Z**. and AHMAD, F., 2024. Water-Air-Soil for Sustainable Agriculture and People Well-being.
2. H.N. Asghar, Z. Shah, A.A. Siyal, Saifullaha, M. Yousra**, Z, Mushtaq**, M. Iqbal, M. Anjum and W. Mukhtar. 2024. Abstract Book: 20th International Congress of Soil Science "Soil Health: A key to Food Security".
3. Ahmet ÇELİK, Zubair ASLAM, Korkmaz BELLİTÜRK, Ali AHMAD and **Zain Mushtaq**. 2023. Latest Studies and Developments in Agriculture and Environment. **IKSAD PUBLISHING HOUSE.**

### (C). Book Chapters

1. Zuhra, N., Akhtar, T., Yasin, M. R., **Mushtaq, Z**., Sajjad, H., Javed, S., ... & Baran, M. F. (2024). Impact of Fluorides and Fluorocarbons Contamination on the Environment and Human Health. In *Fluoride and Fluorocarbon Toxicity: Sources, Issues, and Remediation* (pp. 121-161). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-97-7733-4_4.
2. Parnian, A., Parvizi, H., Selmy, S., & **Mushtaq, Z**. (2024). Haloculture: A Pathway to Reduce Climate Change Consequences for Societies. In *Integration of Core Sustainable Development*

*Goals in Rural Areas: Current Practices of Water, Energy, Food, Climate Change, and Ecosystems* (pp. 385-413). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-981-97-7733-4_4.

3. **Mushtaq, Z**., Muzammil, A., Bellitürk, K., Anwar, W., Akhter, A., Khan, H.A.A., Parnian, A. and Rahman, S.U., 2024. Role of Rhizobacteria in Phytoremediation of Heavy Metal. In *Heavy Metal Remediation: Sustainable Nexus Approach* (pp. 183-211). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-53688-5_9

4. **Mushtaq, Z.,** Islam, M., Saeed, S., Bellitürk, K., Ilić, P., & Parnian, A. (2024). Nanoclay Packaging Materials as Biodegradable. In S. Mehta, F. Islam, & A. Imran (Eds.), *Innovations in Engineering and Food Science* (pp. 278-298). IGI Global. https://doi.org/10.4018/979-8-3693-0819-6.ch011

5. **MUSHTAQ, Z**., SAEED, S., DEMİR, C., Fırat, M., BARAN, M.I. and SİDDİQUİ, A.R., 2024. ROLE OF SPRAYERS DRONE IN SUSTAINABLE AGRICULTURE. *Water-Air-Soil for Sustainable Agriculture and People Well-being*, p.21.

6. POPOVIĆ, Z., ILIĆ, P., **MUSHTAQ, Z**., RASHID, A., BJELIĆ, L.S., MARKIĆ, D.N., FAROOQİ, Z.U.R., BALOCH, M.Y.J. and RIAZ, S., 2024. NOISE AS AN AIR POLLUTANT AND CLEAN ENERGY FOR SUSTAINABLE AGRICULTURE. *Water-Air-Soil for Sustainable Agriculture and People Well-being*, p.196.

7. Itrat, N., Nazir, A., Saif, K., **Mushtaq, Z.,** Nisa, M.U., Habib, A. and Saeed, M.A., 2024. Antidiabetic Flavonoids from Natural Sources. *Advances in Pharmacognosy and Phytochemistry of Diabetes*, p.44.

8. Itrat, N., Nazir, A., Habib, A., Nisa, M.U., Rahim, M.A., Ejaz, A., Majeed, I. and **Mushtaq, Z**., 2024. Natural Products and Insulin Release from Beta Cells of Pancreas. *Advances in Pharmacognosy and Phytochemistry of Diabetes*, p.125.

9. J. Tabassum., **Mushtaq, Z** and Jahan, N. (2024). Advancements in Germination and Seedling Stress Tolerance in Crop Species. Advancements in Plants Stress Tolerance & Their Medicinal Use. The Running Line LLC Publishers.

10. Qurban. A., Javed, M.A and **Mushtaq. Z.** (2024). Plant-Based Nutritional and Stress Response Studies. Advancements in Plants Stress Tolerance & Their Medicinal Use. The Running Line LLC Publishers.

11. Nazir, A., Itrat, N., un Nisa, M., Habib, A., Majeed, I., Rahim, M.A., Ejaz, A., **Mushtaq, Z**. and Zafar, A., 2024. Active Antidiabetic Principles with Antioxidant Properties for the Treatment of Diabetes Mellitus. *Advances in Pharmacognosy and Phytochemistry of Diabetes*, p.115.

12. Itrat, N., Nazir, A., Saif, K., **Mushtaq, Z**., Nisa, M.U., Habib, A. and Saeed, M.A., 2024. Antidiabetic Flavonoids from Natural Sources. *Advances in Pharmacognosy and Phytochemistry of Diabetes*, p.44.

13. Itrat, N., Nazir, A., Habib, A., Nisa, M.U., Rahim, M.A., Ejaz, A., Majeed, I. and **Mushtaq, Z**., 2024. Natural Products and Insulin Release from Beta Cells of Pancreas. *Advances in Pharmacognosy and Phytochemistry of Diabetes*, p.125.

14. Nazir, A., Itrat, N., un Nisa, M., Habib, A., Majeed, I., Rahim, M.A., Ejaz, A., **Mushtaq, Z**. and Zafar, A., 2024. Active Antidiabetic Principles with Antioxidant Properties for the Treatment of Diabetes Mellitus. *Advances in Pharmacognosy and Phytochemistry of Diabetes*, p.115.

15. **Mushtaq**. Z., A. ÇELİK., S. Saeed., M. Islam., K. Bellitürk., I.R. Malik. and A. ADİLOĞLU. 2023.

Microbial biofortification: a much-needed strategy to combat prevailing micronutrient malnutrition. Latest Studies and Developments in Agriculture and Environment. IKSAD PUBLISHING HOUSE.

16. Nazir, A., Itrat, N., Shahid, A., **Mushtaq, Z**., Abdulrahman, S.A., Egbuna, C., Adetuyi, B.O., Khan, J., Uche, C.Z. and Toloyai, P.E.Y., 2022. Orange Peel as Source of Nutraceuticals. In Food and Agricultural Byproducts as Important Source of Valuable Nutraceuticals (pp. 97-106). Springer, Cham.
17. Nazir., A., Itrat. I., **Mushtaq, Z** and Habib. A. 2022. ROSEMARY (*SALVIA ROSMARINUS* L.) SCHEID: AROMATIC PLANT. In Food and Agricultural; Nutraceuticals (pp. 94-124). Cham.

**(D).Abstracts**

1. **Mushtaq, Z**., H.N. Asghar and Z.A. Zahir. 2020. PGPR: present role, mechanism of action and future prospects along bottlenecks in commercialization. Abst. In: 18 th International Congress of Soil Science, February 11-13, 2020. Karachi, Pakistan.
2. Shahzad, F., H.N. Asghar, M. Naveed, **Z. Mushtaq**, A. Haddayat and M.A. Ali. 2020. Interaction of endomycorrhizae, rhizobacteria and compost on phosphorus availability in onion. Abst. In: 18 th International Congress of Soil Science, February 11-13, 2020. Karachi, Pakistan.
3. Shabaan, M., H.N. Asghar, Z.A. Zahir, **Z. Mushtaq**, M.J. Sarwar, M. Nadeem and M.A. Ayub. 2018. Bioaugmentation with Metal Resistant Rhizobacteria to Regulate Pea Growth in Lead (Pb) Contaminated Soil. Abst. In: 17$^{th}$ International Congress of Soil Science, 13-15 March, 2018. Faisalabad, Pakistan.
4. Bukhari. T.A., **Z. Mushtaq**, H.N. Asghar and Z.A. Zahir. Cumulative Effect of PGPRand Press Mud on Growth and Yield of Aloe Vera in Nickel Contaminated Soil. Abst. In: 17$^{th}$ International Congress of Soil Science, 13-15 March, 2018. Faisalabad, Pakistan.
5. Ejaz. M, S. Bashir, H. N. Asghar, Z. Aslam, N. K. Niazi, Z. A. Saqib, **Z. Mushtaq**, M. Shabaan and M. A. Ahmad. 2017. Use of bacterial isolates to improve soil health and plant growth in crude oil contaminated soil. Int. conference on Advances in Agriculture Resource Management (April 5-7). Institute of Soil and Environmental Sciences and Department of Agronomy, University of Agriculture, Faisalabad, Pakistan.

**(E). Scientific paper presentation**

1. **Mushtaq. Z**., H. N. Asghar and Z. A. Zahir. 2017. Cumulative effect of PGPR and press mud on growth and yield of okra in chromium contaminated soil. Int. conference on Advances in Agriculture Resource Management (April 5-7). Institute of Soil and Environmental Sciences and Department of Agronomy, University of Agriculture, Faisalabad, Pakistan.

## Courses Taught

1. Soil Microbiology (SS-309)
2. Physical Properties of Soil (SS-301)
3. Trace Elements in Agriculture (SS-411)
4. Soil Genesis and Morphology
5. Soil and Water Conservation
6. Land Degradation and Management
7. Introductory Biochemistry

## Analytical Techniques

Have experience to work on autoclave, Biosafety cabinet, Micro Centrifuge Machine, Desiccator, Micropipettes, Incubator, Incubating Shaker, Digital Balance, Laminar Flow Cabinet, Microscope, Flame Photometer, Hot plate, OD Meter, SPAD Chlorophyll Meter, Digital Conductivity Meter, Portable photosynthesis system CIRAS- 3, Digital Colony Meter, pH Meter, Micro-plate Reader, Kjeldhal's Apparatus, Spectrophotometer, Freeze dryer, etc.

## Microbiological Techniques

Isolation, Purification, Preservation and Inoculation of microbial strains, Gram Staining, Sterilization, Oxidase activity, Catalase activity, Chitinase activity, Exopolysaccharide production assay, Siderophore production assay, Phosphate solubilization assay, Indole 3-acetic acid assay, etc.

## Languages

I have a good capability in reading, writing, listening, and speaking the international language, English. Urdu is my national language and Punjabi is my mother tongue.

## Computer Skills

I am proficient in the use of Microsoft Office suite, in effectively presenting research findings. I can use online resources in gathering appropriate information for research and investigation.

## Membership of Societies

1) Member of Soil Science Society of Pakistan (Regd.) (Membership No. Std-1079).
2) Member of "Soil and Environmental Sciences students society (Regd.)".
3) Member of The Agrarian Society (Regd.)

## Extracurricular activities

- **Nomination** from University of Agriculture, Faisalabad for participating in Dawn Pakistan and Agri Expo-2019
- **Oral paper presenter** in international conference on Advances in Agriculture Resource Management" held at University of Agriculture, Faisalabad.
- Certificate of Distinction in Cricket on annual sports program (2015), University of Agriculture, Faisalabad.

- Certificate of participation on International Workshop on "Current status of Fertilizer Use in Pakistan", (2015) University of agriculture, Faisalabad.
- Certificate of appreciation at spring festival 2015.
- Certificate of appreciation for contributing in DICE Agriculture and Food Science, 2016.
- Certification of appreciation for contributing in Agri./Textile Exhibition during Rabi Festival 2016.
- Certification of appreciation for contributing in Agri. Exhibition during spring festival 2016.
- Certification of appreciation for participation in annual function of ISES (2016).
- Certification of appreciation for contributing as Vice President of Soil and Environmental Sciences Students Society, Regd (2017-2018).
- Certificate of appreciation for contributing in Agricultural Exhibition 2017.
- Certificate of appreciation for contributing in All Pakistan DICE-AFS Agriculture and Food Science (Innovation event, 2017).
- Certification of appreciation for participating in International Seminar on POTASSIUM FOR SUSTAINABLE CROP PRODUCTION IN PAKISTAN, 2017.
- Certification of participation in International Workshop on Potential & Limitations for Mungbean Production, 2017.
- Certification of participation in International Conference on Advances in Agricultural Resource Management, 2017.
- Certification of participation in Capacity Building Workshop "Biosafety Measures in Agriculture, 2017.
- Certification of appreciation for successful holding the 17$^{th}$ International congress of Soil Science. 2018.
- Certification of appreciation for contributing in 1$^{st}$ Entrepreneurs Festival Faisalabad, 2018.

**References:** will be furnished if required.