

Dr. Muhammad Baqir Hussain

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Citizenship: Pakistan,

Date of birth: September 07, 1985,

Residential Address: House # 14, Raza Street, Near Ali Street # 15/ Jamia Sahib-uz-Zaman, New Gulgashat Colony, Multan (60000), Pakistan.

Postal Address: Department of Soil and Environmental Sciences, Faculty of Agriculture and Environmental Sciences, MNS-University of Agriculture, Multan.



Education

- **PhD** (2014, University of Agriculture Faisalabad, Pakistan)
Thesis Title: Rhizobium inoculation for inducing drought tolerance in wheat.
IRSIP (Sep. 2012 – March 2013, The University of Adelaide, SA, Australia)
- **M.Sc. (Hons.)** (2009, University of Agriculture Faisalabad, Pakistan)
Thesis Title: Potential of *rhizobium* spp. for improving growth and yield of rice.
- **B.Sc. (Hons.)** (2007, University of Agriculture Faisalabad, Pakistan)
Internship Report Title: Isolation, maintenance and preparation of diazotrophic inocula for cereals.

Experiences

Since Jan. 2018, Assistant Professor, MNS University of Agriculture, Multan, Pakistan.

Teaching courses

- SES-301 (Introduction to Environmental Science) 2(2-0)
- SES-401 (Introduction to Soil Science) 3(2-1)
- SES-402 (Soil and Water Pollution) 2(2-0)
- SES-401 (Soil Microbiology and Environment) 4(3-1)
- SES-513 (Microbial Ecology and Plant Growth) 3(3-0)
- SES-704 (Soil Microbiology and Biotechnology) 3(2-1)
- SES-710 (Soil and Environmental Microbiology) 3(3-0)
- SES-711 (Principles and Applications of Bioremediation) 3(3-0)

Other responsibilities

- Convener "Mango Blossom Festival Committee", MNSUAM.
- Secretary "Climate Change Combatting Volunteer Society"
- Member "Clean and Green Pakistan Committee"
- Member "Departmental Self-Assessment Report Committee"
- Member "Naat and Kirrat Club"
- Convener "Postgraduate Admission Test Committee"
- Coordinator "Agriculture Volunteers Society"
- Secretary departmental Board of Studies, Dept. of Soil and Environmental Sciences
- Convener Research Committee of the Dept. of Soil and Environmental Sciences
- Convener Internship Evaluation Committee of the Dept. of Soil and Environmental Sci.
- Advisor undergraduate studies in Agriculture (6th and 8th semester)
- Postgraduate advisor department of Soil & Environmental Sciences

Event management

- Member “Organizing Committee” of the blood camp organized by Regional Blood Center Multan at MNS-University of Agriculture Multan, December 19, 2018.
- Member “Registration and Invitation Committee” of 1st International Conference on Soil and Crop Health in Changing Climate, November 28-29, 2018
- Member “Organizing Committee” of 1st International Conference on Soil and Crop Health in Changing Climate, November 28-29, 2018
- Secretary “Technical Committee” of 1st International Conference on Soil and Crop Health in Changing Climate, November 28-29, 2018
- Focal person/ member management committee of “One day seminar on Smog Pollution: Causes, Effects and Solutions” on February 28, 2018
- Member organizing committee of “one day training workshop on Sustainable Use of Salt Affected Soils and Brackish Water” on March 27, 2018

Oct. 2017 – Jan. 2017, Agricultural Officer (Field), Soil Fertility Research, Multan, Pakistan.

- Worked on Bio-fortification of Zn and Fe and balanced fertilization in wheat crop

April 2017 – Sept. 2017, Visiting Faculty, Bahauddin Zakariya University, Multan, Pakistan.

- Taught a course “SES-102 (Soil Science) 3(2-1)”

Nov. 2016 – Feb. 2017, Visiting Faculty, MNS University of Agriculture, Multan, Pakistan.

- Taught a core course “SS-704 (Soil Microbiology & Biochemistry) 3(2-1)”

Feb. 2016 - July 2016, Visiting Faculty, Bahauddin Zakariya University, Multan, Pakistan.

- Taught a core course “SS-402 (Soil-Water-Plant Relationship) 3(3-0)”
- Co-supervised three Masters Students for thesis research.
- Co-supervised one Honors student for internship experimentation and report writing.

Jan. 2015 - Jan. 2016, Assistant Professor, MNS University of Agriculture, Multan, Pakistan.

Courses Taught

- SES-101 Geology, Soil & Environment 4(3-1)
- SES-302 Salt Affected Soils & Water Quality 3(2-1)
- SES-303 Chemical Properties of Soil 3(2-1)
- SES-401 Soil Microbiology 3(2-1)

Administrative experience

- Incharge Department of Soil Science, Aug. 11, 2015 – Dec. 06, 2015.
- Academic Coordinator, April 20, 2015 – Jan. 11, 2016.
- Senior Tutor, May 4, 2015 – Dec. 7, 2015,
- Incharge Computer Lab, Mar. 21, 2015 – Nov. 11, 2015.
- Chairman Cafeteria Committee, Feb. 18, 2015 – Jan. 08, 2016.
- Deputy Coordinator Academics, Mar. 04, 2015 - April 19, 2015.
- Member Accreditation Committee, Jan. 08, 2016 – Jan. 11, 2016.
- Member Cafeteria Committee, Jan. 08, 2016 – Jan. 11, 2016.

Event Management

- World Soil Day, Dec. 05, 2015.
- World Environment Day, June 05, 2015

- Major Selection Seminar, June 03, 2015.
- Biosafety Training Workshop for Young Scientists, May 14, 2015.

Representation and Participation

- 3rd All Pakistan Zestival 2015, Bahaudin Zakriya University, Multan, May 07-09, 2015.
- Spring Festival “Bahar Manthar”, Multan, March 24-28, 2015.

Study Tours Organized

- Organized and lead a study tour for the students of B.Sc. (Hons.) Agriculture to “Soil Survey Department, Lahore” on 27.10.2015.
- Organized and lead a study tour for the students of B.Sc. (Hons.) Agriculture to “Ghazi Tractors Pvt. Ltd.” on 26.10.2015.
- Organized and lead a study tour for the students of B.Sc. (Hons.) Agriculture to “University of Agriculture Faisalabad” on 16.05.2015.
- Organized and lead a study tour for the students of B.Sc. (Hons.) Agriculture to “Manais Farm” (a progressive farmer) at Tiba Sultanpur, Vehari, Pakistan on 09.05.2015.

Oct. 2014 - Jan. 2015, Assistant Professor, COMSATS Institute of Information Technology, Vehari, Pakistan.

- Teaching, research and administrative responsibilities.

Research Interests

- Plant-Microbe interaction under extreme environments (drought, salinity, heavy metals)
- Soil microbial community role in P and N plant available pools under drying conditions
- Remediation of heavy metal contaminated soils
- Plant growth promoting rhizobacteria based biofertilizers for non-legumes

Reviewing experience

- Higher Education Commission Pakistan (NRPU projects)
- Clean-Soil, Air, Water
- Soil and Environment
- Pakistan Journal of Agriculture Sciences
- Acta Agriculture Scandinavia
- Arid Land Research and Management
- Agricultural Research & Technology: Open Access Journal (ARTOAJ)

Research projects (3)

- **Principle investigator** of the project titled “Exploiting indigenous soil microbial resource for sustainable production of cotton-wheat on phosphorus deficient soils under drought stress”. Submitted to Punjab Agricultural Research Board (worth Rs. 11.635 million) 2018.
- **Principle investigator** of the project titled “Microbial assisted growth and production of Salicornia spp. and Quinoa in marginal soils under drought stress”. Submitted to Pakistan Science Foundation under Pak-Iran collaborative project (worth Rs. 1.0 million) 2018.

- **Principle investigator** of the project titled “Improving nutrient and water use efficiency of cotton-wheat cropping system using plant growth promoting bacteria and partial root-zone drying”. Submitted to Punjab Agricultural Research Board (worth Rs. 5.058 million) 2018.

Postgraduate research students (HEC approved supervisor)

Class	Role	Student number	Status
MSc (Hons.)	Supervisor	04	Completed
MSc (Hons.)	Member	05	Completed
MSc (Hons.)	Supervisor	03	In progress
MSc (Hons.)	Member	06	In progress
PhD	Supervisor	01	In progress
PhD	Member	02	In progress

Publications (33, IF: 24.687; Citations: Google, 545; SCOPUS, 218; H-index: 07)

Research articles (22)

International Impact Factor Journals

1. Ahmad, I., M.J. Akhtar, A. Zakir, **M.B. Hussain**, A. Khaliq, M.F. Saeed, M.A. Farooqi and N. Ahmed. **2020**. Co-inoculation of biogas slurry and *Bacillus* strain CIK-515 in improving nutrient concentration and yield of potato (*Solanum tuberosum*). **Pakistan Journal of Botany**. 52(4):1465-1472. (IF: 0.75)
2. Ahmed, N., S. Ahsen, M.A. Ali, **M.B. Hussain**, S.B. Hussain, M.K. Rasheed, B. Butt, I. Irshad and S. Danish. **2020**. Rhizobacteria and silicon synergy modulates the growth, nutrition and yield of mungbean under saline soil. **Pakistan Journal of Botany**. 52(1): 9-15. (IF: 0.75)
3. Ahmed, N., **M.B. Hussain**, M. Murtaza, M.A. Ali, S. Mahmood, M.A. Qazi, I. Ahmad and Z. Haider. **2019**. Silicon improves rice nutrition and productivity under salinity. **Pakistan Journal of Botany**. 51(3): 837-843. (IF: 0.75)
4. **Hussain, M.B.**, Z.A. Zahir, I. Mehboob, S. Mahmood, N. Ahmed, Tanveer-ul-Haq, I. Ahmad and M. Imran. **2019**. *Mesorhizobium ciceri*-CR-39 inoculation to wheat for drought tolerance at critical growth stages. **Pakistan Journal of Botany**. 51(1): 65-72. (IF: 0.75)
5. Zeb, H., A. Hussain, M. Naveed, A. Ditta, S. Ahmad, M.U. Jamshaid, H.T. Ahmad, **M.B. Hussain**, R. Aziz and M.S. Haider. **2018**. Compost enriched with ZnO and Zn-solubilizing bacteria improves yield and Zn-fortification in flooded rice. **Italian Journal of Agronomy**. 13: 310-316. (IF: 0.965)
6. Raza, M.A.S., M.F. Saleem, I.H. Khan, **M.B. Hussain** and G.M. Shah. **2018**. Amelioration in growth and physiological efficiency of sunflower (*Helianthus annuus* L.) under drought by potassium application. **Communications in Soil Science and Plant Analysis**. 49(18): 2291-2300. (IF: 0.687)
7. **Hussain, M.B.**, S. Mahmood, N. Ahmed and H. Nawaz. **2018**. Rhizobial inoculation for improving growth physiology, nutrition and yield of maize under drought stress conditions. **Pakistan Journal of Botany**. 50(5): 1681-1689. (IF: 0.75)

8. Ahmad, I., M.J. Akhtar, S. Mehmood, K. Akhter, M. Tahir, M.F. Saeed, **M.B. Hussain**, and S. Hussain. **2018**. Combined application of compost and *Bacillus* sp. CIK-512 ameliorated the lead toxicity in radish by regulating the homeostasis of antioxidants and lead. ***Ecotoxicology and Environmental Safety***. 148: 805-812. (IF: 4.527)
9. Hussain, S., **M.B. Hussain**, A. Gulzar, M. Zafar-ul-Hye, M. Aon, M. Qaswar and M. Rizwan. **2017**. Time of zinc and phosphorus applications to maize is depended on nutrient-nutrient and nutrient-inoculation interactions. ***Soil Science and Plant Nutrition***. 63(4): 351-357. (IF: 1.415)
10. Mahmood, S., I. Daur, **M.B. Hussain**, S.G. Al-Solaimani, S. Ahmad, A.A. Bakhshwain and A.K. Elsafor. **2017**. Silicon application with rhizobacteria to regulate mung bean response to saline water irrigated conditions. ***CLEAN - Soil, Air, Water***. 45(8) DOI:10.1002/clen.201600436 (IF: 1.512)
11. Khakwani, A., M. Imran, I. Ahmad, R. Waqas, S. Hussain, S.M. Nadeem, **M.B. Hussain**, M. Arif and M. Arshad. **2017**. Comparative efficacy of bio-organic and mineral phosphate on growth, yield and economics of wheat (*Triticum aestivum* L.) grown by different methods. ***Communications in Soil Science and Plant Analysis***. 48(1): 73-82. (IF: 0.687)
12. Nawaz, H., N. Hussain, A. Yasmeen, S.A.H. Bukhari and **M.B. Hussain**. **2017**. Seed priming: A potential stratagem for ameliorating irrigation water deficit in wheat. ***Pakistan Journal of Agricultural Sciences***. 54(2), 241-254. (IF: 0.618)
13. **Hussain, M.B.**, Z.A. Zahir, H.N. Asghar, R. Mubarak and M. Naveed. **2016**. Efficacy of rhizobia for improving photosynthesis, productivity and mineral nutrition of maize. ***CLEAN – Soil, Air, Water***. 44(11): 1564-1571. (IF: 1.512)
14. **Hussain, M.B.**, Z.A. Zahir, H.N. Asghar and Sajid Mahmood. **2014**. Scrutinizing rhizobia to rescue maize growth under reduced water conditions. ***Soil Science Society of America Journal***. 78: 538-545. (IF: 1.997).
15. **Hussain, M.B.**, Z.A. Zahir, H.N. Asghar and M. Asgher. **2014**. Can catalase and EPS producing rhizobia ameliorate drought in wheat. ***International Journal of Agriculture and Biology***. 16(1): 3-13. (IF: 0.902).
16. Naveed, M., **M.B. Hussain**, Z.A. Zahir, B. Mitter and A. Sessitsch. **2014**. Drought stress amelioration in wheat through inoculation with *Burkholderia phytofirmans* strain PsJN. ***Plant Growth Regulation***. 73: 121-131. (IF: 2.473)
17. Naveed, M., M.A. Qureshi, Z.A. Zahir, **M.B. Hussain**, A. Sessitsch and B. Mitter. **2014**. L-Tryptophan dependent biosynthesis of indole-3-acetic acid (IAA) improves plant growth promotion and colonization of maize by *Burkholderia phytofirmans* PsJN. ***Annals of Microbiology***. 65: 1381-1389. (IF: 1.431)

National Non-impact Factor Journals

1. Habib, R., K. Mubeen, A. Matloob and **M.B. Hussain**. **2020**. Interference of horse purslane (*Trianthema portulacastrum* L.) on growth and yield of soybean [*Glycine max* (L.) Merr.]. ***Pakistan Journal of Weed Science Research***, 26 (1): 61-73.
2. Zafar-ul-Hye, M., U. Aslam, B. Muqaddas and **M.B. Hussain**. **2017**. Connotation of *Enterobacter cloacae*-W6 and *Serratia ficaria*-W10 with or without carriers for improving growth, yield and nutrition of wheat. ***Soil and Environment***. 36(2): 182-189.
3. Asghar, H.N., Z.A. Zahir, M.A. Akram, H.T. Ahmad and **M.B. Hussain**. **2015**. Isolation and screening of beneficial bacteria to ameliorate drought stress in wheat. ***Soil and Environment***. 34: 100-110.

4. Ali, T., S. Mahmood, M.Y. Khan, A. Aslam, **M.B. Hussain**, H.N. Asghar and M.J. Akhtar. **2013**. Phytoremediation of cadmium contaminated soil by auxin assisted bacterial inoculation. *Asian Journal of Agriculture and Biology*. 1(2): 79-84.
5. **Hussain, M.B.**, I. Mehboob, Z.A. Zahir, M. Naveed and H.N. Asghar. **2009**. Potential of *Rhizobium* spp. for improving growth and yield of rice. *Soil and Environment*. 28(1): 49-55.

Review article (1)

1. Naveed, M., I. Mehboob, M.A. Shakar, **M.B. Hussain** and M. Farooq. **2015**. Biofertilizer in Pakistan: Initiatives and limitations. *International Journal of Agriculture and Biology*. 17: 411-420. (IF: 0.902)

Book chapter (6)

1. Ahmad, I., M. Tahir, U. Daraz, A. Ditta, **M.B. Hussain** and Z.U.H. Khan. **2020**. Responses and Tolerance of Cereal Crops to Metal and Metalloid Toxicity. *In: Agronomic Crops, Vol. 3: Stress Response and Tolerance*, M. Hasanuzzaman (ed.), **Springer Nature Singapore Pte Ltd.** pp. 235-264.
2. Ahmed, N., S. Masood, S. Ahmad, S. Bashir, S. Hussain, W. Hassan, R.I. Khandekar, **M.B. Hussain** and M.A. Ali. **2019**. Soil management for better crop production and sustainable agriculture. *In: Agronomic Crops, Vol. 2: Management Practices*, M. Hasanuzzaman (ed.), **Springer Nature Singapore Pte Ltd.** pp. 47-72.
3. Ullah, S., **M.B. Hussain**, M.Y. Khan and H.N. Asghar. **2017**. Ameliorating salt stress in crops through plant growth promoting bacteria. *In: Plant-Microbe Interactions in Agro-Ecological Perspectives*, D.P. Singh, H.B. Singh, R. Prabha (eds), **Springer, The Netherlands**. pp. 549-575.
4. Naveed, M., **M.B. Hussain**, I. Mehboob and Z.A. Zahir. **2017**. Rhizobial amelioration of drought stress in legumes. *In: Microbes for Legumes Improvement*, A. Zaidi, M.S. Khan and J. Musarrat (Eds.), 2nd Edition, **Springer International Publishing AG, Switzerland**. pp. 341-365.
5. Ahmad, I., M. Imran, **M.B. Hussain** and S. Hussain. **2017**. Remediation of organic and inorganic pollutants from soil: The role of plant-bacteria partnership. *In: Chemical Pollution Control with Microorganisms*, N.A. Anjum (Ed.), **Nova Publishers, New York, USA**. pp. 197-244.
6. Naveed, M., I. Mehboob, **M.B. Hussain** and Z.A. Zahir. **2015**. Perspectives of rhizobial inoculation for sustainable crop production. *In: Plant Microbe Symbiosis- Applied Facets*, N.K. Arora (Ed.), **Springer, India**. pp. 209-239.

Magazine/ popular article (4)

1. **Hussain, M.B.** **2020**. Phosphorus crisis: Pakistan perspective. *Business News*. 15(120): 4 (January 02, 2020).
2. **Hussain, M.B.**, H. Nawaz and N. Hussain. **2016**. Integrated strategies: Agrarian commendations. *Kissan Wing*, 12(5): 44-45.
3. Zahir, Z.A., S.S. Akhtar and **M.B. Hussain**. **2012**. Microbial biotechnology for sustainable production of legumes. *Farming Outlook*, 11(2): 8-12.
4. **Hussain, M.B.**, Z.A. Zahir, M. Arshad. **2011**. Microbial strategies to induce drought tolerance in crops. *Farming Outlook*, 10(3): 24-30.

Conference Proceedings (35)

Full length papers

1. **Hussain, M.B.**, S. Mahmood, Z.A. Zahir, M. Naveed, M. Imran, I. Ahmad, N. Ahmed and H. Nawaz. **2016**. Modulating nutrition, physiology and production of maize through *Rhizobium phaseoli* and *Mesorhizobium ciceri* inoculation under drought stress conditions. **Proceedings of International Conference on Water Resources and Arid Environments**. pp. 549-559. http://icwrae-psipw.org/images/stories/2016/Session_4A-Agriculture/Hussain-Modulating_nutrition_physiology__production_of_maize.pdf
2. **Hussain, M.B.** and Z.A. Zahir. **2016**. Rhizobium inoculation improves photosynthetic water use efficiency and yield of wheat in water limited environments. p. 122-123. *In: Abstracts Book of 16th International Congress of Soil Science on "Healthy Soils for Food Security"*. Zahir, Z.A., H.N. Asghar, N.K. Niazi, S. Bashir, M. Naveed and M. Iqbal (eds), Soil Science Society of Pakistan. ISBN: 978-969-8269-02-9.
3. Ahmad, H.T., Z.A. Zahir, H.N. Asghar, **M.B. Hussain**, S. Mahmood and M.A. Akram. **2016**. Amelioration of water deficit stress by rhizobial inoculation. p. 255-256. *In: Abstracts Book of 16th International Congress of Soil Science on "Healthy Soils for Food Security"*. Zahir, Z.A., H.N. Asghar, N.K. Niazi, S. Bashir, M. Naveed and M. Iqbal (eds), Soil Science Society of Pakistan. ISBN: 978-969-8269-02-9.
4. **Hussain, M.B.** and Z.A. Zahir. **2015**. Rhizobium inoculation to ameliorate the impact of water deficit stress in wheat. p. 33-34. *In: Proceedings of International Conference on "Soil Sustainability for Food Security"*. Asghar, H.N., A. Wakeel, M. Sabir and N.K. Niazi (eds). Institute of Soil & Environmental Sciences, University of Agriculture, Faisalabad, Pakistan.

Abstracts

1. Sattar, B., S. Ahmad, **M.B. Hussain**, M. Ali and M. Bakhtawar. **2020**. Bioactive-sulfur coated DAP for improving maize production. p. 110. 18th International Congress of Soil Science on "Wise soil management ensures better environment and livelihood". February 11-13, Sind Agriculture University, Tandojam-Pakistan.
2. Shah, S.H., **M.B. Hussain**, Tanveer-ul-Haq and G. Haider. **2020**. Isolation and screening of thermo tolerant phosphorus solubilizing PGPR from cotton (*Gossypium hirsutum* L.) rhizosphere. p. 211. 18th International Congress of Soil Science on "Wise soil management ensures better environment and livelihood". February 11-13, Sind Agriculture University, Tandojam-Pakistan.
3. Batool, Z., **M.B. Hussain**, S. Ahmad and H.N. Farid. **2020**. Selecting efficient phosphorus solubilizing bacterial isolates for improving growth of tomato seedlings. p. 212. 18th International Congress of Soil Science on "Wise soil management ensures better environment and livelihood". February 11-13, Sind Agriculture University, Tandojam-Pakistan.
4. Farid, G., Tanveer-ul-Haq, **M.B. Hussain** and A. Matloob. **2020**. Risk Assessment of Cadmium in Wastewater irrigated area of Multan by Geographic Information System (GIS). p. 282. 18th International Congress of Soil Science on "Wise soil management ensures better environment and livelihood". February 11-13, Sind Agriculture University, Tandojam-Pakistan.
5. Qayyum, M., **M.B. Hussain**, M.U. Jamshaid and H.N. Farid. **2020**. Characterizing cotton rhizosphere bacterial isolates for plant growth promoting potential on maize seedlings. p. 493. 18th International Congress of Soil Science on "Wise soil management ensures better environment and livelihood". February 11-13, Sind Agriculture University, Tandojam-Pakistan.

6. Khan, M.S., M.U. Jamshaid, **M.B. Hussain**, R.M. Ikram and M. Gul. **2020**. Evaluation of fungi-endophytic bacteria consortium to promote growth and production of chickpea under water limited conditions. p. 499. 18th International Congress of Soil Science on "Wise soil management ensures better environment and livelihood". February 11-13, Sind Agriculture University, Tandojam-Pakistan.
7. Qayyum, M.O.F., Tanveer-ul-Haq, M. Imran, A. Matloob, **M.B. Hussain**, A. Hussain, and S. Ahmad. **2019**. Evaluation of salt tolerance in date palm germplasm. p. 24. 2nd International Conference on "Climate Smart Agriculture: The Way towards Sustainability", November 26-27, MNS-University of Agriculture, Multan, Pakistan.
8. Ali, W., **M.B. Hussain**, M.U. Jamshaid, A. Matloob, Tanveer-ul-Haq and S.H. Shah. **2019**. Bio-organic amendments for improving growth and production of maize (*Zea mays* L.). p. 23. 2nd International Conference on "Climate Smart Agriculture: The Way towards Sustainability", November 26-27, MNS-University of Agriculture, Multan, Pakistan.
9. Shah, S.H., **M.B. Hussain**, Tanveer-ul-Haq, and G. Haider. **2019**. Nitrogen loaded biochar in combination with acidified compost improve cotton production and reduce nitrate leaching. p. 22. 2nd International Conference on "Climate Smart Agriculture: The Way towards Sustainability", November 26-27, MNS-University of Agriculture, Multan, Pakistan.
10. Jamshaid, M.U., M. Naveed, **M.B. Hussain** and W. Ali. **2018**. Performance of fungi and endophytic bacteria isolated from rhizospheric soil and chickpea tissues for drought tolerance and mutual compatibility. p. 81. 1st International Conference on "Soil and Crop Health in Changing Climate", November 28-29, MNS-University of Agriculture, Multan, Pakistan.
11. Haq, T.U., S. Shabala, M. Imran, **M.B. Hussain**, A. Hussain, M.U. Jamshaid and W. Ahmad. **2018**. Evaluating the genetic variation for arsenic tolerance in barley germplasm. p. 49. 1st International Conference on "Soil and Crop Health in Changing Climate", November 28-29, MNS-University of Agriculture, Multan, Pakistan.
12. Daraz, U., I. Ahmad, **M.B. Hussain**, M. Tahir, G.M. Shah, S.M. Nadeem, M.F. Saeed, A. Zakir and M.J. Akhtar. **2018**. Population density and functional characterization of Rhizobacteria associated with *Zea mays* under salt and cadmium stress. p. 27. 1st International Conference on "Soil and Crop Health in Changing Climate", November 28-29, MNS-University of Agriculture, Multan, Pakistan.
13. Hanzal, T., W. Ahmed, Mati-Ui-Hanan, S. Rukh, **M.B. Hussain** and P. Khanum. **2018**. Treatment of brackish water with acids for improving nutrient use efficiency, growth and yield of wheat under field conditions. p. 24-25. 1st International Conference on "Soil and Crop Health in Changing Climate", November 28-29, MNS-University of Agriculture, Multan, Pakistan.
14. Hussain, N., M. Jamil, **M.B. Hussain** and N. Hassan. **2018**. Bio-priming technique in maize seeds mitigates drought stress by active physiological behavior and potential yield. "Second National Conference on Emerging Trends in Bioinformatics and Biosciences" (NCETBB-18), August 9-11, Hazara University Mansehra, Pakistan.
15. **Hussain, M.B.** N. Ahmad, M. Murtaza, S. Mahmood and S.R. Sultana. **2018**. Silicon alleviates impact of salinity on rice in salt affected soil. p. 253. 1st International and 2nd National Conference on Soil and Environment "Challenges and Opportunities to Boost Agriculture in Changing Climate", March 26-28, Bahadur Campus, Bahauddin Zakariya University, Layyah, Pakistan.
16. **Hussain, M.B.**, S. Hussain, S. Khan, M. Zafar-ul-Hye, M. Qaswar, T. Shahjahan and M. Aon. **2018**. Fertilizer and Seed Coatings of Bacteria for Improved Phosphorus Nutrition

- and Maize Productivity. p. 94-95. 17th International Congress of Soil Science on "Soils: Ultimate Solution to Food Security and Climate Change". March 13-15, Serena, Faisalabad-Pakistan.
17. Shahjahan, T., **M.B. Hussain**, W. Ahmed, Tanveer-Ul-Haq, F. Nawaz and M. Ali. **2018**. Comparative Effect of Polymer and Bacteria Coated DAP on Growth and Nutrition of Maize Fodder Irrigated with Waste Water. p. 232. 17th International Congress of Soil Science on "Soils: Ultimate Solution to Food Security and Climate Change". March 13-15, Serena, Faisalabad-Pakistan.
 18. Ahsan, S., **M.B. Hussain** and N. Ahmad. **2018**. Ameliorating the Impact of Salinity on Mung Bean through Silicon and Plant Growth Promoting Rhizobacteria. p. 259. 17th International Congress of Soil Science on "Soils: Ultimate Solution to Food Security and Climate Change". March 13-15, Serena, Faisalabad-Pakistan.
 19. Aslam, S., M.U. Jamshaid, M. Naveed, Tanveer-Ul-Haq, **M.B. Hussain** and M. Gul. **2018**. Synergistic Effect of Plant Growth Promoting Bacteria and Trichoderma on Growth and Yield of Mungbean under Salinity Stress. p. 261. 17th International Congress of Soil Science on "Soils: Ultimate Solution to Food Security and Climate Change". March 13-15, Serena, Faisalabad-Pakistan.
 20. Raza, M.A.S., **M.B. Hussain**, R. Iqbal, S. Ahmad and I.H. Khan. **2018**. Iron-Zinc Interaction and Drought Amelioration in Wheat through Improved Growth, Physiology, Nutrition and Productivity. p. 302. 17th International Congress of Soil Science on "Soils: Ultimate Solution to Food Security and Climate Change". March 13-15, Serena, Faisalabad-Pakistan.
 21. **Hussain, M.B.**, Z.A. Zahir, M. Naveed, R. Mubarak and H.N. Asghar. **2014**. Efficacy of *Rhizobium phaseoli* and *Mesorhizobium ciceri* for improving photosynthesis, productivity and mineral nutrition of maize in field conditions. p. 102. *In*: 15th International Congress of Soil Science on "Soil Management in Changing Climate", March 18-20, NARC, Islamabad, Pakistan.
 22. **Hussain, M.B.**, Z.A. Zahir and P. Marschner. **2013**. Carbon source affects the response of microbial activity, biomass and community composition to soil drying. p. 172-173. *In*: 11th Biennial conference of "Pakistan Society for Biochemistry and Molecular Biology" on "Molecular Biosciences – Challenges and Opportunities", November 25-28, The University of the Punjab, Lahore, Pakistan.
 23. **Hussain, M.B.**, Z.A. Zahir, H.N. Asghar, M. Yahya and M.U. Jamshaid. **2013**. Amelioration of water deficit impact on wheat through rhizobial inoculation. p. 166. *In*: 12th International and 24th National Chemistry Conference, October 28-30, B.Z. University, Multan.
 24. Zahir, Z.A., **M.B. Hussain**, H.N. Asghar and M. Arshad. **2013**. Climate change and microbial strategies to mitigate its impact on crops. p. 114. *In*: AgMIP-Pakistan kickoff workshop and international seminar on climate change, June 4-6, University of Agriculture, Faisalabad, Pakistan.
 25. **Hussain, M.B.** and Z.A. Zahir. **2013**. Rhizobium inoculation to ameliorate the impact of water deficit stress in wheat. p. 114. *In*: International Conference on Biotechnology: Prospects and Challenges in Agriculture, Industry, Health and Environment, April 22-26, National Institute of Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan.
 26. **Hussain, M.B.**, Z.A. Zahir and S. Mahmood. **2012**. Impact of plant growth promoting rhizobia on growth, physiology and yield of maize. p. 130. *In*: 3rd International conference of plant scientists and 12th National meeting of plant scientists, September 1-3, Quaid-iAzam University, Islamabad, Pakistan.

27. **Hussain, M.B.**, Z.A. Zahir, H.N. Asghar, R. Mubaraka and S. Mahmood. **2012**. Assortment of *Rhizobium* spp. holding drought tolerance and catalase activity for growth promotion of wheat under PEG-induced water stress. p. 121. *In*: 14th congress of soil science on "Soil Science: Service to Mankind and Environment". March 12-15, Expo-center, Lahore, Pakistan.
28. **Hussain, M.B.**, Z.A. Zahir, R. Mubaraka, I. Ahmad, H.N. Asghar and M. Khalid. **2011**. Screening of rhizobial inoculum for survival and healthier growth of wheat seedling under drought. p. 428. *In*: International conference on "Prospects & Challenges to Sustainable Agriculture". July 14-16, Faculty of Agriculture, Rawalakot, University of Azad Jammu & Kashmir, Azad Kashmir, Pakistan.
29. **Hussain, M.B.**, Z.A. Zahir, H.N. Asghar, M.J. Akhtar and I. Ahmad. **2011**. Screening of potent rhizobial inoculants for better growth of wheat seedlings under drought conditions. p. 45. *In*: National conference on "Sustainable Agriculture in Changing Climate". July 7-9, Bara Gali, Abbottabad, Pakistan.
30. **Hussain, M.B.**, Z.A. Zahir, H.N. Asghar and M. Ahmad. **2011**. Can rhizobia improve growth of wheat seedlings under drought? p. 182-183. *In*: 2nd International conference of plant scientists and 11th National meeting of plant scientists, February 22-24, GC University, Lahore, Pakistan.
31. **Hussain, M.B.**, Z.A. Zahir, M. Naveed, I. Mehboob and S.M. Nadeem. **2008**. Potential of *Rhizobium* species for improving growth and yield of rice. p. 13. *In*: 9th Biennial conference of "Pakistan Society for Biochemistry and Molecular Biology". December 17-20, Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, Pakistan.

Professional skills/ experiences

- Skilled in teaching, research and administrative tasks.
- Excellent in publications, interpretation of data and deriving innovation.
- Proficient in working with Microsoft office Word, Excel, PowerPoint.
- Proficient in using STATISTIX v 8.1
- Working experience with Spectrophotometer, Flame photometer, Kjeldhal apparatus, IRGA, CO₂ analyzer (Servomax IRGA), plant antioxidant analysis, soil-plant nutrient analysis, Chlorophyll meter, bacterial isolation, bacterial inoculation, bacterial characterization, PLFA analysis, microbial biomass C analysis, bacterial inoculum preparation and seed inoculation, laboratory-greenhouse and field trials.
- Data handling, analysis, writing and publication.

Countries Visited

- Australia (For IRSIP during PhD)
- Kingdom of Saudi Arabia (To present PhD work in a conference)

Membership of Professional Associations

- Soil Science Society of Pakistan (March 24, 2010 to date)
- Pakistan Botanical Society
- Society of Chemical Industry – London, UK (Dec. 14, 2019 to Dec.13, 2020)

Achievements

- Received funding for research training under International Research Support Initiative Program (Sept. 2012 - Mar. 2013) of Higher Education Commission of Pakistan.

- Received M.Sc. (Hons.) leading to Ph.D. scholarship (2008-2013) from Higher Education Commission of Pakistan.

English proficiency

2. IELTS overall band 6.5

Trainings/ Seminars/ Workshops Attended (18)

1. Two day workshop on “**Farmer Integrated Learning Model**”, University of Canberra, Australia and MNS-University of Agriculture, Multan, Pakistan, December 16-17, 2019.
2. One day workshop for “**Protection and Registration of Intellectual Property Rights (IPRs)**”, ORIC and Dept. of Agri. Engineering, MNS-University of Agriculture, Multan, Pakistan, September 16, 2019.
3. Two day workshop on “**Dialogue with Teachers on Promoting Social Harmony**”, Pakistan Institute of Peace Studies, Hotel One, Multan, March 03-04, 2019.
4. Five day short course on “**Human Resource Management for Government Officers**”, Punjab Management and Professional Development Department, Lahore, February 25 to March 01, 2019.
5. Two day workshop on “**Promoting Social Harmony and Critical Consciousness**”, Pakistan Institute of Peace Studies, Best Western Hotel, Lahore, January 04-05, 2019.
6. One day workshop on “**Critical Thinking and Scientific Writing**”, ORIC, MNS-University of Agriculture, Multan, September 04, 2018.
7. Three day workshop on “**Basic Statistics with R**”, Dept. of Agri-business and Applied Economics, MNS-University of Agriculture, Multan, August 06-08, 2018.
8. One day training on “**Basic Leadership Skills**”, ORIC, MNS-University of Agriculture, Multan, June 01, 2018.
9. One day training on “**Technology Development Fund**”, ORIC, Bahauddin Zakariya University, Multan, May 15, 2018.
10. One day training workshop on “**Faculty Development on Start-ups and How to Manage Business Incubation Centers by Improving Industry, Academia, Government, and Society Linkage**”, Pakistan Institute of Entrepreneurs, Islamabad and ORIC MNS-University of Agriculture, Multan, March 19, 2018.
11. Seminar on “**Entomology for Better World**”, MNS-University of Agriculture, Multan, Pakistan, February 26, 2018.
12. International seminar on “**Pulses and Wheat for Food Security**”, MNS-University of Agriculture, Multan, Pakistan, February 25, 2018.
13. National Workshop on “**Biofertilizer Development, Commercialization and Legislation in Pakistan**”, National Agricultural Research Center, Islamabad, Pakistan, January 17, 2018.
14. Workshop on “**Beans with Benefits: Potential and Limitations for Mungbean Production**”, Institute of Soil and Environmental Sciences, University of Agriculture, Faisalabad, Pakistan, August 8-10, 2017.
15. Workshop on “**The Art of Facilitation**”, Department of Agronomy, Bahauddin Zakariya University Multan, Pakistan, May 19, 2016.
16. Workshop on “**Intellectual Property Rights and Patent Drafting**”, a joint venture of PASTIC-PSF, IPO and FVS-Bahauddin Zakariya University, Multan, Pakistan, May 11, 2016.
17. Workshop on “**DISCovering Yourself & Others**”, Department of Agronomy, Bahauddin Zakariya University Multan, Pakistan, May 06, 2016.

18. Seminar on **“Significance of Micronutrients in Crop Production”**, Department of Soil Science & Department of Agronomy, Bahauddin Zakariya University Multan, Pakistan, April 11, 2016.
19. Training on **“Extension & Communication Skills”**, ASLP Mango Production Project in Bahauddin Zakariya University Multan, Pakistan, August 29, 2015.
20. **“Biosafety Training Workshop for Young Scientists”**, MNS University of Agriculture (MNSUA), Multan, Pakistan, May 14, 2015.
21. IPI-ISES Capacity Building Seminar on **“Balanced Use of Fertilizers for Quality Produce and Sustainable Agriculture”**, Serena Hotel, Faisalabad, Pakistan, August 12, 2014.
22. **“AgMIP-Pakistan Kickoff Workshop and International Seminar on Climate Change”**, University of Agriculture, Faisalabad, Pakistan, June 4-6, 2013.
23. 1st National training course on **“Bacterial Identification and Metagenomics”**, National Institute of Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan, March 5-9, 2012.
24. Two day workshop on **“Applications of Biotechnology for Wheat Improvement”**, National Institute of Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan, February 28-29, 2012.
25. Hands on training on **“Modern Techniques in Research on Abiotic Stress Tolerance in Plants”**, Nuclear Institute for Agriculture and Biology (NIAB), Faisalabad, Pakistan, September 05-09, 2011.
26. One day Seminar on **“Trends in Environmental Biotechnology”**, National Institute of Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan, April 18, 2011.

Conferences Participated (12)

1. International Conference on **“Smart Potassium Nutrition Management for Crops under Changing Climate”**. Engro Fertilizers Pvt. Ltd and Department of Soil and Environmental Sciences, MNS University of Agriculture, Multan-Pakistan. March 03, 2020.
2. 18th International Congress of Soil Science on **“Wise soil management ensures better environment and livelihood”**. Sind Agriculture University, Tandojam-Pakistan. February 11-13, 2020.
3. International Conference on **“Sustainable Environmental Technologies”**, Dept. of Environmental Sciences, COMSATS University, Islamabad, Vehari Campus, Pakistan, December 05, 2019.
4. 2nd International Conference on **“Climate Smart Agriculture: The Way towards Sustainability”**, MNS-University of Agriculture, Multan, Pakistan, November 26-27, 2019.
5. 1st Aus-Pak International Conference on **“Wheat for Food Security”**, MNS-University of Agriculture, Multan, Pakistan, March 24-25, 2019.
6. 1st International Conference on **“Soil and Crop Health in Changing Climate”**, Department of Soil and Environmental Sciences, MNS-University of Agriculture, Multan, Pakistan, November 28-29, 2018.
7. 17th International Congress of Soil Science on **“Soil: Ultimate Solution to Food Security and Climate Change”**, Serena, Faisalabad, Pakistan, March 13-15, 2018.
8. International Conference on **“Plant Based Food: Current Scenario and Future Perspectives”**, MNS-University of Agriculture, Multan, Pakistan, March 5-6, 2018.
9. 7th International Conference of Water Resources and Arid Environments, King Saud University, Riyadh, Kingdom of Saudi Arabia, December 4-6, 2016.

10. 2nd International Conference on Malnutrition **“Malnutrition Kills! Can we see the writing on the wall?”**, Bahauddin Zakariya University Multan, Pakistan, April 7-8, 2016.
11. 16th International Congress of Soil Science on **“Healthy Soils for Food Security”**, PMAS-Arid Agriculture University, Rawalpindi, Pakistan, March 15-17, 2016.
12. **International Conference on “Soil Sustainability for Food Security”**, Institute of Soil & Environmental Sciences, University of Agriculture, Faisalabad, Pakistan, November 15-17, 2015.
13. 15th International Congress of Soil Science on **“Soil Management in Changing Climate”**, National Agriculture Research Center (NARC), Islamabad, Pakistan, March 18-20, 2014.
14. International Conference on **“Biotechnology: Prospects and Challenges in Agriculture, Industry, Health and Environment”**, National Institute of Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan, April 22-26, 2013.
15. 14th Congress of Soil Science on **“Soil Science: Service to Mankind and Environment”**, Expo-center, Lahore, Pakistan, March 12-15, 2012.
16. **“2nd International Conference of Plant Scientists and 11th National Meeting of Plant Scientists”**, GC University, Lahore, Pakistan, February 22-24, 2011.
17. 13th International Congress of Soil Science on **“Efficient Resource Management for Sustainable Agriculture”**, Serena Hotel Faisalabad, Pakistan, March 24-27, 2010.
18. 9th Biennial Conference of **“Pakistan Society for Biochemistry and Molecular Biology”**, PMAS Arid Agriculture University, Rawalpindi, Pakistan, December 17-20, 2008.

References

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