Dr. Sajid Masood

(PhD, Germany & Postdoc. China)

Assistant Professor

Technical Assessor (ISO/IEC 17025:2017)

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SUMMARY

I am a professionally qualified Soil Scientist, working as an Assistant Professor in the Department of Soil Science, Bahauddin Zakariya University (BZU) Multan, Pakistan. I received my B.Sc. (Hons.) Agriculture-Soil Science and M.Sc. (Hons.) Soil Science in 2006 and 2008, respectively, from the University of Agriculture Faisalabad (UAF), Pakistan. It is a matter of pride that I won the university merit scholarship during my undergraduate studies (2002-2006) on account of excellent academic performance. In 2008, I was awarded the Higher Education Commission (HEC)-DAAD (Pak-Germany) scholarship for PhD studies from Christian Albrechts University Kiel, Germany. I completed my PhD in 2012 and explored the interaction between salinity and high boron in wheat plants. In 2015, I was awarded a 2-year "CAS President's International Fellowship Initiative for Postdoctoral Researchers in China" and studied PGPR-induced nutrient valorizations in plants-mechanistic insights.

I have expertise in integrated plant nutrient management (IPNM) and fertilizer product development. In this regard, I have worked on several inventions and developed unique products i.e. "NP Khas", "Nitros Plus", "Soil Conditioner", and "Compost" using industrial biowaste, kitchen waste, charcoal, and biowaste, respectively. This ground-breaking approach of fertilizer invention not only focuses on sustainable fertilizer product development, but also manages solid waste for effective resource management. To support this, I have submitted patents "NP Khas" and "Soil Conditioner' to the Intellectual Property Organization (IPO) in Pakistan (No. 28/2024 and 206/2025). In parallel, I have been focusing on soil salinity tolerance in plants and IPNM either through the use of plant growth-promoting rhizobacteria (PGPR) or the use of biowaste-carrier materials amended fertilizer products.

Apart from the above, I have been recognized as a HEC approved PhD supervisor. I have also served as a Guest Editor of Frontiers in Plant Science from 2022-2024. Since 2012, I have been active reviewer of peer-reviewed journals. With more than 12 years of professional experience in teaching, research, and administration at National and International academic Institutes, Organizations, and Fertilizers Companies, I have served the aforementioned Institutes/Organizations in the capacity of teaching, research supervision, and team management. It is my achievement that I established the Soil and Water Testing Laboratory and got it certified under ISO 9001:2015, ISO 14001:2015, and ISO 45001:2018 by SGS UK along with site-specific fertilizer recommendations while working with Fatima Fertilizer Company Limited, Pakistan. Moreover, I provided training to my lab team for equipment handling and analysis after calibration and standardization according to the requirements of ISO/IEC 17025:2017. This demonstrates my leadership and management skills in short.

Regarding research projects, I have completed a research project as a Principal Investigator (PI), which was funded by the Higher Education Commission (HEC), Govt. of Pakistan. More recently, I have completed a university research project for evaluating boron dynamics in divergent cotton genotypes under changing climate. It is also worth mentioning that 2 research projects have been submitted to HEC and Punajb Agricultural Research Board (PARB), Pakistan for furnishing grants. It is to my credit that I have not only supervised 4 MPhil scholars but also published their work in leading journals. Currently, I have been mentoring and advising two M.Sc. (Hons.)/MPhil students as a main supervisor and a PhD student as a Co-Supervisor. Altogether, I have published around 68 articles in referred journals, books, and conference proceedings with a cumulative impact factor of about 180.

PROFESSIONAL EXPERIENCE

01 Sep. 2022-Continue	**Assistant Professor (Teaching & Research)** Department of Soil Science, Faculty of Agricultural Sciences & Technology, B.Z.U Multan
24 Jan. 2022-31 Aug. 2022	**Assistant Professor (Teaching & Research)** Inst. of Soil & Environmental Sciences, PMAS-AAUR
12 Jun. 2018-23 Jan. 2022	**Lab Chemist (Tech. & Advisory Services)** Soil & Water Testing Laboratory, Fatima Fertilizer Company Limited, Khanewal Road Multan, Pakistan
28 Aug. 2017-28 Feb. 2018	**Agri. Research Consultant (Research)** AGVEN Pvt. Ltd. Pakistan
May 2015–May 2017	**Postdoctoral Fellow (Research)** Institute of Soil Science, Chinese Academy of Sciences, Nanjing China

	Supervisor: Prof. Dr. Ren Fang Shen
4 Sep. 2012-03 March 2015	**Assistant Professor (Teaching & Research)** Department of Plant Sciences Quaid-i-Azam University Islamabad, Pakistan

QUALIFICATION

2008–2012	**PhD in Plant Nutrition/Soil Science** Institute of Plant Nutrition and Soil Science, Christian Albrechts University Kiel, Germany **Supervisor:** Prof. Dr. Karl Hermann Mühling **Title:** "Interaction of salt stress and boron toxicity on subcellular ion relations, antioxidative activity and soluble apoplastic protein pattern in wheat leaves"
2006–2008	**M.Sc (Hons.) Soil Science (CGPA: 3.59/4.00, 74.25%)** Institute of Soil and Environmental Sciences University of Agriculture Faisalabad, Pakistan **Supervisor:** Dr. Muhammad Iqbal **Title:** "Root biomass and growth of maize (*Zea mays* L.) as influenced by farmyard manure levels in pot culture"
2002–2006	**B.Sc (Hons.) Agriculture-Soil Science (CGPA: 3.89/4.00, 80.31%)** Institute of Soil and Environmental Sciences
1999–2001	**F.Sc Pre-Medical (739/1100, 67.18%)** BISE D.G. Khan, Pakistan
1997–1999	**Matriculation-Science (563/850, 66.23%)** BISE Multan, Pakistan

ACHIEVEMENTS

Research Projects:

- Xylem sap boron in chloride-dominated saline soils under the influence of microbes in rice crop. (No. HEC/FD/2012/1402). (**Status: Completed as a PI**)
- Evaluating the interactive effects of divergent cotton genotypes and boron application to improve cotton productivity on a sustainable basis under changing climate (No. 23/ORIC/BZU). (**Status and Role: Completed as a PI**)
- Boron-tolerant PGPR-infused fertilizer development for sustainable cotton (*Gossypium hirsutum* L.) production in calcareous soils (HEC/R&D/RGA/NRPU/2025/100997). (**Status and Role: Submitted as a PI**)
- Fertilizer product development by using biowaste-carriers to improve phosphorus use efficiency and exportable rice productivity. (**Status and Role: Submitted as a PI**)
- Turning the Thal Desert into Green through the Organic Amendments and Application of Subsurface Water Retention Technology. (PARB/22/253). (**Status and Role: In the approval phase as a Co-PI**)

Patents:

- Filed/registered a patent entitled "Physical process of making activated carbon and its application as a soil conditioner" at Intellectual Property Organization (IPO), Govt. of Pakistan. (Patent Appl. No. 206/2025)
- Filed/registered a patent entitled "Development of NP Khas fertilizer using biowaste and rock phosphate" at Intellectual Property Organization (IPO), Govt. of Pakistan. (Patent Appl. No. 28/2024)
- "Nitros Plus fertilizer synthesis using kitchen waste and synthetic chemical" (In Preparation)
- "Compost Preparation using farmyard manure and vegetables waste" (In Preparation)

Awards:

- University Merit Scholarship, UAF on Account of Academic Performance (2002-2006)
- HEC-DAAD Scholarship for PhD Studies in Germany (2008-2012)
- CAS President's International Fellowship for Postdoctoral Researchers in China (2015-2017)
- HEC Approved PhD Supervisor
- Performance-Based Increment/Honorarium for the year 2023

Honors:

- Received a Shield as a token of appreciation for Keynote Speaker in an International Seminar on "Balanced Fertilization is Key to Farming Success" dated 28-29 January 2023, Expo Center, Lahore, Pakistan.

- Received a Shield as a token of appreciation for Co-organizing/Keynote Speaker in the National Conference entitled "Soil Degradation: An Alarming Threat to Food Security & Environment" on 3-4 March 2022 at Bahauddin Zakariya University Multan, Pakistan.

Certificates:

- Certificate of participation in the Assessor Course Training Based on ISO/IEC 17025:2017 at Lahore, Pakistan. 22-26 September 2025.
- Certificate of Participation in International Conference on "Nexus of Climate Change and DRR: Anticipatory Actions" at Baragali Summer Campus on 01-03 August 2025, University of Peshawar-Pakistan.
- Certificate of Participation in National Symposium on "Sustainable Health Management in the Wake of Climate Change for Food Security" at MNS University of Agriculture Multan, Pakistan on 22 May 2025.
- Certificate of participation in the Level-1 Teachers Training held at Bahauddin Zakariya University Multan, Pakistan. 5-8 May 2025.
- Certificate of participation in the webinar entitled "Data Analysis in R: A Reseracher's Toolkit". 19 April 2025. Organized by Global Association of Plant Scientists (GAPSci).
- Certificate of Participation in a two-day symposium on "Bridging Quality Gaps: KFUEIT's Commitment to National Academic QA". 12-13 March 2025. Khwaja Fareed University of Engineering and Information Technology, Rahim Yar Khan, Pakistan.
- Certificate of Particpation in a seminar on "Metal(loid) Balances in Soils under the Wheat-Miaze System". 18 February 2025, Bahauddin Zakariya University Multan, Pakistan.
- Certificate of participation in Training Workshop on DSSAT "Assessing Climate Change Impact, Adaptation, and Mitigation Using Crop Simulation Models". 27-29 November, 2024, PMAS-Arid Agriculture University Rawalpindi, Pakistan.
- Certificate of oral presentation in 20th International Congress of Soil Science on "Soil Health: A Key to Food Security". 20-22 February 2024, PMAS-Arid Agriculture University, Rawalpindi, Pakistan.
- Certificate of Participation in "Training Workshop for NAEAC Program Evaluators" organized by National Agriculture Education Accreditation Council, HEC, Islamabad, Pakistan on November 23, 2023.
- Certificate of participation in 1st National Seminar on "Scientific Writing" organized by Department of Biochemistry, Bahauddin Zakariya University, Multan, Pakistan on November 07, 2023.
- Certificate of participation in the national workshop on "Empowering Green Leaders: UI Green Metric Workshop for Sustainable Pathways in Pakistani Universities" organized by Quality Enhancement Cell, Khawaja Fareed University of Engineering and Information Technology, Rahim Yar Khan, Pakistan on October 16, 2023.
- Certificate of attendance for participating in the Global Symposium on Soils and Water organized in hybrid format by the Food and Agriculture Organization of the United Nations from 2 to 5 October 2023.
- Received certificate of appreciation for organizing mango seminar on 4 July 2023 at Bahuddin Zakariya University, Multan, Pakistan.
- Delivered a talk in International Seminar on "Balanced Fertilization is Key to Farming Success". 28-29 January 2023, Expo Center, Lahore, Pakistan.
- Certificate of presentation in International Seminar entitled "Efficient Carriers for Microbial Bioproducts" on 07 September 2022 at Pir Mehr Ali Shah Arid Agriculture University Rawalpindi (PMAS-AAUR), Pakistan.
- Participated in an Outreach Activity entitled "Demonstration of Conservation Agriculture Based Climate Smart Agriculture to Rainfed Farming Community" by Pir Mehr Ali Shah Arid Agriculture University Rawalpindi (PMAS-AAUR), Pakistan on 2 June 2022 at Village Bewal, Gujjar Khan, Rawalpindi.
- Participated in Training Workshop on "Non-Chemical Approaches to Preserve Post Harvest Quality of Stored Grains" by Pir Mehr Ali Shah Arid Agriculture University Rawalpindi (PMAS-AAUR), Pakistan on 23-24 May 2022 at PMAS-AAUR.
- Participated in Training Workshop on "Biofertilizer Development for Pulses Production in Pothwar" by Pir Mehr Ali Shah Arid Agriculture University Rawalpindi (PMAS-AAUR), Pakistan on 18-20 May 2022 at PMAS-AAUR.
- Participated in 31st All Pakistan Food Science Conference & Food and Nutrition Expo-2022 entitled "Transformation of Food System for Sustainable Food Future" by Pir Mehr Ali Shah Arid Agriculture University Rawalpindi (PMAS-AAUR), Pakistan on 18-19 March 2022 at PMAS-AAUR.
- Organized and Delivered a talk at the National Conference entitled "Soil Degradation: An Alarming Threat to Food Security & Environment" on 3-4 March 2022 at Bahauddin Zakariya University Multan, Pakistan.

- Participated in the 19th International Congress of Soil Science by Pakistan Society of Soil Science held on 15-17 February 2022 at the University of Agriculture Faisalabad (UAF), Pakistan.
- Completed "Teacher Training Workshop for Newly Appointed Teachers" by Pir Mehr Ali Shah Arid Agriculture University Rawalpindi (PMAS-AAUR), Pakistan on 16-22 February 2022 at PMAS-AAUR.
- Attended 3-Days Awareness Training Session on IMS Standards (ISO 9001:2015, ISO 14001:2015, and ISO 45001:2018) held on 25-27 August 2021 at Pakarab Fertilizers-Multan, Pakistan. (SGS/LHR/IMS/TRG/C/21/05)
- Completed online HARVARD ManageMentor course and received certificates (20x) from 07 Oct. 20220 to 07 Jul. 2021)
- Completed online various training by Fatima Group (7x) from 11 May 2020 to 17 Sep. 2020.
- Completed 2-Days Course Training entitled "Coaching for High Performance" by SCHUITEMA on 16-17 December 2019 in Lahore, Pakistan.
- Completed a 1-day training on "Collaboration for Success" by Carnelian, Fatima Group at Lahore, Pakistan on September 17, 2019.
- Participated in the 17th International Congress of Soil Science entitled "Soil: Ultimate Solution of Food Security and Climate Change" by Pakistan Society of Soil Science on 13-15 March 2018 at Serena Faisalabad, Pakistan.
- Participated in the 15th International Congress of Soil Science entitled "Soil Management in Changing Climate" by Pakistan Society of Soil Science on 18-20 March 2014 at NARC Islamabad, Pakistan.
- Organized "Pakistan Day Celebrations" held on 23 March 2007 at Ayub Hall, University of Agriculture, Faisalabad, Pakistan.

EDITORIAL EXPERIENCE

- Guest Editor of Frontiers in Plant Science for Research Topic "Enhancing Salinity Tolerance in Crop Plants through Agronomic, Genetic, Molecular, and Physiological Approaches (2022-2024)

COMMUNITY SERVICES

- Building Incharge, Department of Soil Science, BZU Multan (2022-Continue)
- Member of Synopsis Evaluation Committee (October 2023-Continue)
- Member of University Stationery and Furniture Purchase Committee, BZU Multan (June 2024-Continue)
- External examiner/Thesis evaluation of M.Sc (Hons.)/MPhil at Govt. College University Faisalabad
- Member of external examination committee/Thesis evaluation of M.Sc (Hons.)/MPhil/PhD at PMAS-Arid Agriculture University Rawalpindi
- Member of external examination committee/Thesis evaluation of MPhil/PhD at Quaid-i-Azam University Islamabad
- Committee Member for the liaison with the fertilizer industry in Pakistan

MEMBERSHIP OF PROFESSIONAL BODIES

- Life Member of Pakistan Society of Soil Science (2012-Continue)
- Member of Asian Phytopathological Society (2023-Continue)

SKILLS

Personal:

- Communication& interpersonal skills
- Decision making
- Time management

Professional:

- Project writing, product development, patenting, experimentation & research supervision
- Equipment handling and quality checks
- SPSS, Sigma Plot, R Studio, Oligo Evaluator

ANALYTICAL SKILLS

- **Irrigation water sampling and analysis:** Tube well irrigation water sampling as per SOPs and determination of water quality indices i.e. pH, EC, Na, Ca+Mg, Carbonates, Bicarbonates, SAR, and RSC as per ASTM protocols
- **Soil sampling and analysis:** Soil sampling as per developed SOPs and determining soil health indices i.e. saturation%, pH, EC, Na, Ca+Mg, SAR, soil organic matter (SOM), total N, available N, available phosphorus, extractable potassium, SAR and gypsum requirement (GR) as per ICARDA guidelines

- DNA extraction and *nifH* gene mapping
- **Plant tissue sampling and analysis:** Plant tissues like leaf, root, and shoot collection as per SOPs and processing for macronutrients (NPK) and micronutrients (B, Fe, and Zn) analysis after digesting them with acid mixture (HNO_3:$HClO_4$ 4:1 v/v)
- **Cellular and subcellular plant extractions and biochemical analysis:** Antioxidants measurements from cellular plant extractions and proteins quantification from subcellular extractions i.e. apoplastic fluid
- **Gas analysis:** Acetylene gas collection from soil samples and measurement of acetylene reduction over time according to acetylene reduction assay for the quantification of biological nitrogen fixation (BNF)

TECHNIQUES AND INSTRUMENTATION

- Atomic Absorption Spectrometry for Ion Analysis
- Chemiluminometer & Spectrophotometer for Antioxidative Enzymatic Activity Measurement
- GC for Enumeration of Soil Ethylene Production or Quantification of Total Nitrogen Fixation
- ICP-OES for Plant Minerals Determination
- Ion Chromatography for Anions Measurements
- Li-Cor 6400 for Photosynthetic Rate Enumeration
- N-Analyzer (Kjeldahl Distillation) for Soil and Plant N Determination
- Osmomat 030 for the Determination of Osmotic Potential in Plant Tissues
- PGPR Inoculation Techniques for Enhancing Nutrient Uptake Efficiency
- qPCR for Quantitative Expression of *nifH* Gene from Soil
- 2-D Gel Electrophoresis Kit for the Quantification of Stress Proteins
- Spectrophotometer for phosphorus and antioxidant enzymatic activity determination
- Flame photometer for Na and K determination
- pH and EC meter for the determination of pH and salt concentrations

MAJOR RESPONSIBILITIES SERVED

- Teaching and practical demonstration of courses i.e. Salt-affected soils, Chemical Properties of Soils, Soil and Water Conservation, Advanced Soil Chemistry, Soil Fertility and Fertilizers, Agricultural Drainage, Agrometeorology, and Trace Elements in Agriculture to M.Sc, M.Phil, and PhD students.
- Independent research and experimentation and advisory recommendations.
- Curriculum development and implantation of departmental policy guidelines as and when required.
- Project writing and funding acquisition from donor agencies.
- Development of standard operating procedures as per guidelines of ASTM and ICARDA.
- Laboratory budget CAPEX & OPEX Budget preparation and procurement of laboratory items.
- Preparation of lab schedules for periodic analysis, verification of equipment standardization, and results.
- Supervise and train students and provide technical training for smooth lab operations.
- Ensure to implement policy and guidelines under the scope of IMS and ISO 17025:2017.
- Preparation of lab audits (internal and external) and management reviews.
- Carry out special analysis required from time to time which involves advanced techniques and the use of advanced instruments like AAS and Kjeldahl distillation apparatus.

RESEARCH PUBLICATIONS

- **Selected Publications:**

1. Jamil, M., **Masood, S.,** Qazi, M.A., Jehan, S., Liaquat, M., Rasool, A., Aon, M., Khan, M.U.K., Rasheed, M.K. 2025. Integrating compost, chemical fertilizers, and PGPR improves productivity of pea (*Pisum sativum* L.). J. Animal Plant Sci. 35, 10389.
2. Hayat, F., Ashraf, M., **Masood, S.,** Hye, M.Z.U., Hussain, S., 2025. Wheat Productivity and micronutrients availability in soil by the use of chemical and organic fertilizers under alkaline calcareous conditions. Soil and Environment. 44: 92-103.
3. Ashraf, M., Qamar, F., Mehran, M., **Masood, S.,** Shahzad, S.M., Javed, M.S., Azhar, M.T., 2025. Zinc nutrition optimization for better cotton productivity on alkaline calcareous soil. Journal of Cotton Research. 8: 14 (2025).

4. Hassan, M.U., Nawaz, M., Barbanti, L., **Masood, S.,** 2025. Editorial: Enhancing salinity tolerance in crop plants through agronomic, genetic, molecular, and physiological approaches. Front. Plant Sci. 16:1554509.
5. **Masood, S.,** Ashraf, M., Hussain, M., Azhar, M.F., Hye, M.Z.U., Farooq, O., Aon, M., Javed, M.T., 2025. Increasing salinity and cadmium enhanced leaf membrane damage and H_2O_2 production irrespective of reduced sodium and cadmium accumulation in wheat (*Triticum aestivum* L.). J. Plant Nutr. Soil Sci. 25: 2116-2126.
6. Saeed, B., Hye, M.Z.U., Malik, N., **Masood, S.,** Iftikhar, Y., 2025. Exploring the efficacy of various ascorbic acid dosages and application methods in alleviating drought stress in sunflower cultivation. Pak. J. Bot. 57: 1-9.
7. **Masood, S.,** Ali, L., Hussain, T., Liaquat, M., Aon, M., Rehman, A.U., Hye, M.Z.U., 2024. Foliar application of gibberellic acid and boric acid enhances boron translocation in leaves and improves the yield of guava (*Pisidium gujava* L.) cv. Sada Bahar Gola. J. Plant Nutr. 48: 1227-1244.
8. Majeed, A., Khan, M.B., Dawood, A., **Masood, S.,** Naveed, M., Hussain, M., 2024. Phosphorus solubilizing Bacillus sp. strain MN-54 increased the yield and economic returns of pearl millet due to improved phosphorus use efficiency. J. Plant Nutr. 47: 2787-2798.
9. Abbas, S., Tanwir, K., Hussaan, M., **Masood, S.,** Ali, Q., Raza, A., Shahid, M., Chaudhary, H.J., Javed, M.T., 2024. In vitro exploration of Acinetobacter strain (SG-5) for antioxidative potential and phytohormone biosynthesis in maize (*Zea mays* L.) cultivars differing in cadmium tolerance. Environ. Sci. Pollut. Res. 31: 45465-45484.
10. Ashraf, M., Minhas, A., **Masood, S.,** Akhtar, N., Shahzad, S.M., Asif, M., 2024. Soil characterization and plant nutrient indexing of citrus orchards in the central Punjab of Pakistan. Soil Environ. 43: 27-35.
11. Aziz, A., Musharaf, A., Hussain, M., Azhar, M.F., **Masood, S.,** Aon, M., Rasheed, K., Ali, E., Mehboob, N., 2024. Organic and inorganic amendments enhance the growth and productivity of pea (*Pisum sativum* L.) by improving soil microbial biomass carbon. Soil Environ. 43:42-52.
12. Huang, S., Huang, P., **Masood, S.,** Iqbal, M.M., Naz, T., Danish, S., Ansari, M.J., Salmen, S.H., 2024. Enhancing maize growth through the synergistic impact of potassium enrich biochar and spermidine. BMC Plant Biol. 24, 36.
13. Aon. M., Hussain, S., Bashir, M.A., Abbas, M., **Masood, S.,** Ali, Q., 2023. Mineral nitrogen dynamics over time are influenced by peanut waste biochar application in alkaline soil. Pak. J. Biotechnol. 20: 330-338.
14. Piracha, M.A., Ashraf, M., Shahzad, S.M., **Masood, S.,** Akhtar, N., Kausar, R., Shakoor, A., 2023. Arsenic fractionation and speciation in different textured soils supplied with farmyard manure and accumulation by sunflower under alkaline calcareous conditions. Environ. Sci. Poll. Res. 30: 103141-103152.
15. **Masood, S.,** Suleman, M., Hussain, S., Jamil, M., Ashraf, M., Siddiqui, M.H., Nazar, R., Khan, N., Jehan, S., Khan, K.S., Tahir, M., 2023. Fertilizers Containing Balanced Proportions of NH_4^+-N and NO_3^--N Enhance Maize (*Zea mays* L.) Yield Due to Improved Nitrogen Recovery Efficiency. Sustainability 2023, 15, 12547.
16. Aon, M., Aslam, Z., Hussain, S., Bashir, M.A., Shaaban, M., **Masood, S.,** Iqbal, S., Khalid, M., Rehim, A., Mosa, W.F.A., Sas-Paszt, L., Marey, S.A., Hatamleh, A.A., 2023. Wheat Straw Biochar Produced at a Low-Temperature Enhanced Maize Growth and Yield by Influencing Soil Properties of Typic calciargid. Sustainability. 15, 9488.
17. Rashid, M., Hussain, Q., Hayat, R., Ahmad, M., Azeem, M., Alvi, S., Chaudhry, A.N., **Masood, S.,** Khalid, R., Jehan, S., Rehman, O.U., 2023. Deashed biochar as N-carrier extended the N-release by inhibiting N-losses in calcareous soils. Biomass Conversion and Biorefinery. 13, 9549-9564.
18. Hussain, S., Nanda, S., Ashraf, M., Siddiqui, A.R., **Masood, S.,** Khaskheli, M.A., Suleman, M., Zhu, L., Zhu, C., Cao, X., Kong, Y., Jin, Q., Zhang, J., 2023. Interplay Impact of Exogenous Application of Abscisic Acid (ABA) and Brassinosteroids (BRs) in Rice Growth, Physiology, and Resistance under Sodium Chloride Stress. Life MDPI. 13(2), 498.
19. **Masood, S.,** Xue Qiang Zhao, Shen, R.F., 2023. The effect of pH on boron toxicity and nutrient uptake by wheat and rapeseed. J. Plant Nutr. 46, 2167-2181.
20. Hussain, S., Ashraf, M., **Masood, S.,** Suleman, M., Hussain, S., Abid, M., 2022. Nutrient stoichiometry growth characteristics of wheat (*Triticum aestivum* L.) grown with various combinations of nitrogenous and phosphatic fertilizers under alkaline conditions. Soil Environ. 41: 103-113.

21. **Masood, S.,** Khan, K.S., Ashraf, M., Iqbal, M., Mustafa, G., Ali, L., Hussain, Q., Javed, M.T., Ahmed, N., Jamil, M., 2022. Iron supply confers tolerance in rice (*Oryza sativa* L.) due to up-regulation of antioxidative enzymatic activity. South Afr. J. Bot. 151: 315-324. (IF, 3.11)
22. Ali, L., Shaheen, M.R., Ihsan, M.Z., **Masood, S.,** Zubair, M., Shahzad, F., Khalid, A.U.H., 2022. Growth, photosynthesis and antioxidant enzymes modulations in broccoli (*Brassica oleracea* L. var. italic) under salinity stress. South Afr. J. Bot. 148: 104-111. (IF, 3.11)
23. Mustafa, G., Ali, M.A., Smith, D.L., **Masood, S.,** Qayyum, M.F., Rehman, A.U., Ahmad, S., Hussain, S., Arshad, M., Muneer, S., Khan, A.H.A., Fahad, S., Datta, R., Iqbal, M., Schwinghamer, T.D., 2021. Formalin fumigation and steaming of various composts differentially influence the nutrient release, growth and yield of muskmelon (*Cucumis melo* L.). Sci. Rep. 11:21057. (IF, 4.60)
24. Shahid, M., Javed, M.T., Tanwir, K., Akram, M.S., Tazeen, S.K., Saleem, M.H., **Masood, S.,** Mujtaba, S., Chaudhary, H.J., 2020. Plant growth-promoting *Bacillus* sp. Strain SDA-4 confers Cd tolerance by physio-biochemical improvements, better nutrient acquisition and diminished Cd uptake in *Spinacia oleraceae* L. Physiol. Mol. Biol. Plants. 26:2417-2433. (IF, 3.50)
25. **Masood, S.,** Zhao, X.Q., Shen, R.F., 2020. *Bacillus pumilus* promotes the growth and nitrogen uptake of tomato plants under nitrogen fertilization. Sci. Hortic. 272:109581. (IF, 4.30)
26. **Masood, S.,** Zhao, X.Q., Shen, R.F., 2019. *Bacillus pumilus* increases boron uptake and inhibits rapeseed growth under boron supply irrespective of phosphorus fertilization. AoB Plants. 11:1-10. (IF, 3.14)
27. Shahid, M., Javed, M.T., **Masood, S.,** Akram, M.S., Azeem, M., Ali, Q., Gilani, R., Basit, F., Abid, A., Lindberg, S., 2019. Serratia sp. CP-13 augments the growth of cadmium (Cd) stressed *Linum usitatissimum* L. by limited Cd uptake, enhanced nutrient acquisition and anti-oxidative potential. J. Appl. Microbiol. 126:1708-1721. (IF, 4.0)
28. Ahmed, N., Abid, M., Ali, M.A., **Masood, S.,** Rashid, A., Noreen, S., Hussain, S., 2019. Zinc Application enhances biological yield and alters nutrient uptake by cotton (*Gossypium hirsutum* L.). 2019. Commun. Soil Sci. Plant Anal. 50:265-274. (IF, 1.80)
29. Ahmed, N., **Masood, S.,** Abid, M., Ali, M.A., Qayyum, M.F., 2018. Determination of residual and cumulative boron requirement for cotton and wheat crops grown under calcareous soil conditions. Commun. Soil Sci. Plant Anal. 49:1092-1098. (IF, 1.80)
30. Munis, M.F.H., Xu, S., Hakim, Naz, S., Chaudhary, H.J., **Masood, S.,** Farooq, A.U.F., 2018. Diagnosis of *Fusarium graminearum* in Soil and Plant Samples of Wheat by Real-Time PCR. Roman. Biotechnol. Lett. 5:14035-14042. (IF, N/A)
31. Qadir, A., Khan, S.A., Ahmad, R., **Masood, S.,** Irshad, M., Kaleem, F., Kumar, S., Shahzad, M., 2017. Exogenous Ca_2SiO_4 enrichment reduces the leaf apoplastic Na+ and increases the growth of *Abelmoschus esculentus* L. under salt stress. Sci. Hortic. 214:1-8. (IF, 4.30)
32. Israr, D., Mustafa, G., Shahzad, M., Khan, K.S., Ahmed, N., **Masood, S.,** 2016. Interactive effects of phosphorus and *Pseudomonas putida* on chickpea (*Cicer arietinum* L.) growth, nutrient uptake, antioxidant enzymes and organic acids exudation. Plant Physiol. Biochem. 108:304-312. (IF, 6.50)
33. **Masood, S.,** Iqbal, M., Chaudhary, H.J., Munis, M.F.H., 2016. Subcellular compartmentation of sugars in wheat leaves under the influence of salinity and boron toxicity. J. Plant Nutr. 39: 2100-2105. (IF, 2.60)
34. Khan, A., Sirajuddin, Zhao, X.Q., Javed, M.T., Khan, K.S., Bano, A., Shen, R.F., **Masood, S.,** 2016. *Bacillus pumilus* enhances tolerance in rice (*Oryza sativa* L.) to combined stresses of NaCl and high boron due to limited uptake of Na+. Environ. Exp. Bot. 124:120-129. (IF, 5.70)
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- **Total Publications:** 51
  Total Impact Factor: ~130
  Total Citations: 2227
  H-Index: 24
  https://scholar.google.com/citations?user=pqEqyksAAAAJ
- **Publications-Book Chapters:**

1. Ahmed, N., Danish, S., Grewal, A.G., Ilyas, F., **Masood, S.,** Ali, M.A., Hussain, M.B., Ahmad, S., Imran, M., Hussain, S., 2025. Irrigation management in mango orchards. In: Handbook of Research on Mango Fruit: Postharvest Science, Production, Nutrition and Processing Technology. Edited by Sajjad Hussain, Kamrun Nahar and Ishtiaq A. Rajwana. Apple Academic Press. pp. 135-148.
2. **Masood, S.,** Ahmed, N., Hussain, M.B., 2025. Climate Change: Causes, Effects and Solutions for Agriculture and Food Security of Pakistan. In: Climate Change Mitigation and Adaptation to Improve Food Security in South Asia. Edited By Rafiq Islam, AHM Mustafizur Rahman, Heulin Thierry, Mannava Sivakumar. CRC Press, Taylor and Francis, UK. pp. 59-76.

3. Iqbal, K., Hussain, Q., **Masood, S.**, Javed, N., Bilal, M., 2024. Carbon Nanotubes in Environmental Remediation: Soil and Water Applications. In: Environment, Climate, Plant and Vegetation Growth. Springer Nature. pp. 375-390.
4. Latif, F., Ishfaq, N., Azhar, M.A., **Masood, S.,** Batool, F., Hye, M.Z.U., Abid, M., Ahmed, N., Ahmad, S., Qayyum, M.F., Jehan, S., Rasheed, K., 2023. Role of Soil Science in Mitigating Natural and Anthropogenic Disasters. Springer Nature. pp. 113-129.
5. Iqbal, K., **Masood, S.,** Hussain, Q., Khalid, R., Khan, K.S., Akmal, M., Ijaz, M.S., Jamil, M., Azeem, M., Jehan, S., 2023. Phosphorus-Solubilizing Bio-fertilizers. In: Biofertilizers for Sustainable Management. 1st Edition, CRC Press, Boca Raton. pp. 171-181.
6. Mustafa, G., **Masood, S.,** Ahmed, N., Saboor, A., Ahmad, S., Hussain, S., Bilal, M., Ali, M.A., 2019. Seed Priming for Disease Resistance in Plants. Springer Singapore, pp. 333-362.
7. Ahmed, N., **Masood, S.,** Ahmad, S., Bashir, S., Hussain, S., Hassan, W., Khandekar, R.I., Hussain, B., Ali, M.A., 2019. Soil management for better crop production and sustainable agriculture. Springer Singapore, pp. 47-71.
8. Shahzad, M., Qadir, A., **Masood, S.,** 2017. Silicon and alleviation of salt stress in crop genotypes differing in salt tolerance. In book: Silicon in plants, Springer CRC Press, pp. 133-152.
9. **Masood, S.,** Bano, A., Mechanism of potassium solubilization in the agricultural soils by the help of soil microorganisms. In: "Potassium solubilizing microorganisms for sustainable agriculture" edited by Meena, V.S., Maurya, B.R., Verma, J.P., Meena, R.S., 2016. Springer India, pp. 137-147.

- **Conference Proceedings:**

1. **Masood, S.,** Khadim, S., Hye, M.Z.U., Hussain, Q., 2024. Interaction between NaCl and $CdCl_2$ differently influences Na and Cd uptake by wheat. 20th International Congress of Soil Science on "Soil Health: A Key to Food Security". 20-22 February 2024, PMAS-Arid Agriculture University, Rawalpindi, Pakistan.
2. **Masood, S.,** "Recent Trends in Integrated Plant Nutrient Management under Climate Change Scenario". Invited Speaker in International Seminar on "Balanced Fertilization is Key to Farming Success". 28-29 January 2023, Expo Center, Lahore, Pakistan.
3. **Masood, S.,** Integrated Plant Nutrient Management: A Paradigm for Sustainable Crop Production under Changing Climate. Keynote Speaker/Co-Organizer for National Conference on "Soil Degradation: An Alarming Threat to Food Security & Environment". 3-4 March 2022, Bahauddin Zakariya University Multan.
4. **Masood, S.,** Iqbal, M., Ashraf, M., Khan, K.S., N. Ahmed., Hussain, Q., Akmal, M., Ijaz, M.S., 2022. Differential accumulation of Na and Cd in wheat leaves with special reference to the interaction of NaCl and $CdCl_2$. Oral Presentation in "19th International Congress of Soil Science Society of Pakistan, 15-17 February 2022, Faisalabad, Pakistan".
5. **Masood, S.,** Iqbal, M., Ahmed, N., Hussain, Q., 2018. Fe-EDTA alleviates the adverse effects of salinity stress on rice (*Oryza sativa* L.) growth. 17th International Congress of Soil Science Society of Pakistan, 13-15 March 2018, Faisalabad, Pakistan.
6. **Masood, S.,** Wimmer, M.A., Witzel, K., Zörb, C., Saleh, L., Plieth, C., Mühling, K.H., Interaction of salinity and boron toxicity on ion relations, antioxidants and protein pattern of wheat leaves. German Society of Plant Nutrition, September 27-29, 2011, Kiel, Germany
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8. **Masood, S.,** Zörb, C., Wimmer, M.A., Mühling, K.H., Interaction of salinity and boron toxicity on ion relations and protein pattern in the apoplast of wheat leaves. German Society of Plant Nutrition, 11-12 June 2009, Osnabrück, Germany

- **Popular Articles in Newspapers:**

1. **Masood, S.,** Quality tunnel farming. In Dawn newspaper on March 11, 2013.
2. **Masood, S.,** Mühling, K.H., Saline, and organic farming: a need with a future. In Dawn newspaper on Feb. 2nd, 2009.

STUDENTS SUPERVISED

Supervisory Role	M.Phil/M.Sc. (Hons.)	PhD
Supervisor-I	5	-
Supervisor-I	1 (On-going)	-
Supervisor-II	-	1 (as a Co-Supervisor)

DETAIL OF STUDENTS SUPERVISED

Student Name	Title of Thesis/Dissertation	M.Phil/M.Sc. (Hons.)/PhD	Year	Featured Publications out of the Student Theses
Hamza Ali Abid	Determination of boron uptake by divergent cotton genotypes in calcareous soils	M.Sc. (Hons.)	2026 (on-going)	-
Sheraz Khadim	Comparative efficiency of poly4 and other potassium fertilizers in wheat	M.Sc. (Hons.)	2025	Thesis Submitted, whereas manuscript is under preparation
Alamgir Khan	Determination of xylem sap boron in rice plants with special reference to the interaction of PGPR and salinity and PGPR	M.Phil	2015	Khan, A., Sirajuddin, Zhao, X.Q., Javed, M.T., Khan, K.S., Bano, A., Shen, R.F., Masood, S., 2016. Bacillus pumilus enhances tolerance in rice (*Oryza sativa* L.) to combined stresses of NaCl and high boron due to limited uptake of Na^+. Environ. Exp. Bot. 124:120-129
Sirajuddin	Growth response and boron uptake of tomato to excess boron and PGPR supply	M.Phil	2015	Sirajuddin, Khan, A., Ali, L., Chaudhary, H.J., Munis, M.F.H., Bano, A., Masood, S., 2016. *Bacillus pumilus* alleviates boron toxicity in tomato (Lycopersicum esculentum L.) due to enhanced antioxidant enzymatic activity. Sci. Hortic.200:178-185.
Islamuddin	Physiological traits and root exudates analysis for organic acids pattern in wild plants on exposure to chromium	M.Phil	2013	udDin, I., Bano, A., Masood, S., 2015. Chromium toxicity tolerance of Solanum nigrum L. and Parthenium hysterophorus L. with reference to ion pattern, antioxidation activity and root exudation. Ecotoxicol. Environ. Safe. 113:271-278.
Dania Israr	Apoplastic ion concentration in chickpea leaves affects plant growth under the interactive effect of chemical fertilizers and PGPR	M.Phil	2013	Israr, D., Mustafa, G., Shahzad, M., Khan, K.S., Ahmed, N., Masood, S., 2016. Interactive effects of phosphorus and

				Pseudomonas putida on chickpea (*Cicer arietinum* L.) growth, nutrient uptake, antioxidant enzymes and organic acids exudation. Plant Physiol. Biochem. 108:304-312.

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