<u> CURRICULUM – VITAE</u>

Rizwana Maqbool, Ph.D.,

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ACADEMICS

2010 - 2015	Ph.D., (Crop Sciences), Washington State University, Pullman WA, USA	
2007 - 2009	9 M.Sc., (Plant Breeding and Genetics), University of Agriculture Faisalaba	
	Pakistan (Merit scholarship holder)	
2003 - 2007	B.Sc., (Agriculture), University of Agriculture Faisalabad, Pakistan (Merit	
	scholarship holder)	

RESEARCH EXPERIENCES

2022 – To date	Associate Professor, Dept. Plant Breeding and Genetics, University of
	Agriculture Faisalabad, Pakistan
2016 - 2022	Assistant Professor, Dept. Plant Breeding and Genetics, University of
	Agriculture Faisalabad, Pakistan
2015 – 2016	Lecturer, Dept. Plant Breeding and Genetics, University of Agriculture
	Faisalabad, Pakistan
2010 - 2015	Ph.D. Student, Dept. of Crop and Soil Sciences, Washington State
	University, Pullman, WA.

The doctoral research was composed of both basic and applied objectives to achieve a balanced expertise in the field of crop sciences. In basic research, molecular mechanism regulating tiller number trait in wheat was studied by cloning and functionally characterizing the wheat ortholog of rice gene. For applied research, herbicide tolerant alleles from a winter wheat background was transferred to spring wheat cultivar using Marker Assisted Background Selection (MABS). Three promising lines are being planted in the Washington state yield evaluation program. In the course of study and research, comprehensive training was obtained on

1) **Bioinformatics analysis:** In silico gene expression analysis using RNA-seq data and micro array data, Protein structure and function prediction and Vector construction for gene transformation and VIGS

- 2) **Plant Molecular biology:** Physical and genetic mapping using DNA gel blot analysis, Real Time PCR for gene expression and PCR Cloning (Long range, GC rich PCR amplification and cloning)
- 3) **Transformation and VIGS:** Transient silencing and stable transformation of Wheat Tiller gene by agrobacterium mediated genetic transformation
- 4) **Microscopy:** Histological analysis of selected RNAi plants with the help of SEM and paraffin embedding
- 5) Transferring 'CLEARFIELD' Herbicide Resistance into Washington Spring Wheat Cultivars
- 6) **Population development and Field experience**: Developed and characterized wheat mutant population (4000 lines at M4 generation) and DH populations for MABS

2007 - 2009Graduate Student (M.Sc.,), Dept. of Plant Breeding and Genetics,
University of Agriculture, Faisalabad, Pakistan

Evaluation of wheat cultivars on the basis of morphological diversity and glutenin composition

Main objective of this research is to identify agronomically better Pakistani wheat cultivars with high molecular weight glutenin using markers for high industrial value

2003 - 2007	Bachelor Student, Dept. of Plant Breeding and Genetics,
	University of Agriculture, Faisalabad, Pakistan

Internship:Four Months internship experience at Agricultural Biotechnology Research
Institute, Ayub Agricultural Research Institute, Faisalabad.

TEACHING EXPERIENCE

- PBG-201 Elementary Genetics and Plant Breeding
- PBG-307 Molecular and Modern Techniques in Plant Breeding
- PBG-415 Genomics in Agriculture
- PBG-411 Preparation of Research Project & Scientific Writing
- PBG-316 IPR and Variety Development
- PBg-712 Advances in Genetics
- PBG-715 Mutation Breeding
- SST-702 Seed Legislation, Certification and Intellectual Property Rights

PROFESSIONAL RESPONSIBILITIES

2010-2023

a) Actively participated in writing international competitive research grants

- b) Trained undergraduate and graduate students for various molecular biology skills
- c) Lab manager and in charge of lab storage and maintenance
- d) In charge of Green house facility of Gill Lab

PROFESSIONAL AFFILIATION

American Society of Plant Biologists (ASPB) member

Pakistan society of Plant Breeders and Geneticists, member

SOFTWARE SKILLS

- a) Next gen sequencing analysis: Galaxy (https://usegalaxy.org)
- b) Professional program: Map Maker, Gene Marker, Vector NTI, pDRAW 32, Mendeley
- c) GMP, R Studio, Minitab and Statistica

EXTRA AND CO-CURRICULAR ACTIVITIES

- a) Vice president of Pakistan Student Association (PSA) at WSU
- b) Arranged accommodation and orientations for international visitors
- c) Sportswoman

COMPLETED AND ACTIVE RESEARCH PROJECTS

- 1. Principal Investigator: Gene Editing of Biological Agents for Nutritional, Biochemical and Therapeutic purposes: Crop Domain funded by PCSIR of worth 100 million Rs. **On Going**.
- 2. Principal Investigator: "Accelerating genetic gain in wheat through hybrid breeding in Bangladesh, Ethiopia and Pakistan" funded by ACIAR, Australia **On Going**.
- 3. Co-Principal Investigator: Dissemination of biofortified wheat germplasm in district Lasbela, Balochistan to overcome hidden hunger funded to EFS, UAF of worth 1.8 million Rs. **On Going**
- 4. Co-Principal Investigator: Development of cost effective wheat rust surveillance system funded by EFS, UAF of worth 1.94 million Rs **On Going**.
- 5. Principal Investigator: Rapid development of high yielding drought tolerant lines of wheat through introgression of stable QTLs/Genes based on novel 90K iSELECT SNP assay and Circular Consensus Sequencing (CCS) (USAID AND PARB, PK of worth 6 million Rs. **Completed**)
- 6. Team Leader: Improving yield, drought and salinity tolerance in wheat through GA-Sensitive dwarfing gene system (PARB, PK of worth 4 million Rs. **Completed**)
- 7. Co-Principal Investigator: Climate Smart Wheat: Development of heat and drought tolerant wheat for Pakistan (USAID of worth 4 million Rs. **Completed**)
- 8. Co-Principal Investigator: Increasing soybean adaptability, yield and oil content by conventional plant breeding and genetic improvement practices (PARB of worth 6 million Rs. **Completed**)

 Co-Principal Investigator: TIGR2ESS: Transforming India's Green Revolution by Research and Empowerment for Sustainable food Supplies (University of Cambridge, UK, Completed)

INVENTION DISCLOSURE

Novel dwarfing gene systems to improve abiotic stress tolerance and other agronomic traits in wheat – Inventors – Kulvinder S Gill, Amandeep K Dhaliwal, Amita Mohan, Gaganjot Sidhu, and Rizwana Maqbool (submitted to Washington State University, July 2014)

PARTICIPATION IN SCIENTIFIC ACTIVITY/ TRAINING WORKSHOPS/RESEARCH PROGRAMS

(Foreign)

- i. Completed long distance training course on "Grain Security for Officials from Developing Countries" sponsored by Henan University of Technology from March 6, to July 30, 2016 China through GSR long distance education platform of Henan University of Technology at University of Agriculture, Faisalabad.
- ii. Completed "Licensing academy in Intellectual Property and Technology Transfer" from June 19-June 30, 2017 at University of California, School of Law, Davis, USA.
- iii. Participated at Washington State University, Pullman, WA, USA under WSU-UAF collaboration to discuss future collaborations and visit of different facilities from July 27th to August 2nd, 2024
- **iv.** Visited University of California Davis, CA, USA for wheat/cereal partnership for future from 5th August to 9th, 2024.
- v. Attended ACIAR funded research project meeting and International Wheat Conference in Sydney and Perth Australia from September 15 to September 28th, 2024
- vi. Attended and presented in UAF ADB Joint Workshop on "Promoting Climate Smart Agriculture Research in Pakistan" February 28, 2024 at CAS Auditorium, University of Agriculture, Faisalabad. (funded by ADB)
- i. Participated in ADB-IRRI Knowledge-Sharing Workshop on Strengthening Climate Resilient and Low Carbon Agriculture on 11-13 December 2024, IRRI, Los Banos, Laguna, Philippines (funded by ADB)

(Local)

- i. Completed "29th Master Trainers faculty Professional Development Program (MT-FPDP) from October 17 to December 09, 2016 at LID, HEC Islamabad.
- ii. Participation in Four day workshop on "Hybrid Course Design and Development" held on 18-21 October, 2016 at University of Agriculture, Faisalabad.
- iii. Participation in 1st Aus-Pak International Conference on Wheat for Food Security held on 25-26 March 2019, at MANSUA Multan, Pakistan.

PRESENTATIONS

- 1. **Rizwana Maqbool**, Ragupathi Nagarajan, Jasdeep S Mutti, and Kulvinder S. Gill (2014) Cloning and characterization of *TaMOC1*, a gene controlling tillering in wheat. Plant Biology 2014 (ASPB), Portland OR.
- 2. **Rizwana Maqbool**, Ragupathi Nagarajan, and Kulvinder S. Gill (2015) Identification and Characterization a Gene Controlling Tiller Trait of Wheat. Plant Biology Western section 2015 (WASPB), Pullman, WA.
- 3. Dhaliwal A, Mohan A, Sidhu G, **Maqbool R**, and Gill KS (2015) A mutant resource in pregreen revolution hexaploid wheat. Western ASPB Plant Biology meeting, Pullman, WA, June 26-28.
- 4. **Maqbool R.,** Kumar. N., Z. Ahmed and Gill. K. (2018). Marker assisted background selection method; a fast breeding method for crop improvement in Soybean: Challenges and opportunities on 17-18 September 2018, Faisalabad Pakistan.

PUBLICATIONS

- Uddin, Safeer, Muhammad Jafar Jaskani, Zhanao Deng, Rizwana Maqbool, Summar Abbas Naqvi, Saroj Parajuli, Naseem Sharif, Abdul Rahman Saleem, Steven Ledon, Sufian Ikram, and et al. 2024. "Phenotypic and Molecular-Markers-Based Assessment of Jamun (Syzygium cumini) Genotypes from Pakistan" Horticulturae 10, no. 8: 879. https://doi.org/10.3390/horticulturae10080879
- Ishaq, I., R. Maqbool., A. Shakeel and F. S. Awan. (2023). Identification and characterization of morphophysiological and yield-oriented traits for drought improvement in wheat. Pak. J. Agri. Sci., Vol. 60(4), 517-526; ISSN (Print) 0552-9034, ISSN (Online) 2076-0906. DOI:10.21162/PAKJAS/23.71
- Farooq, A., Khan, U.M., Khan, M.A., Khan, Z., Ali, R. Maqbool., and M., Sajjad. Male sterility systems and their applications in hybrid wheat breeding. CEREAL RESEARCH COMMUNICATIONS (2023). <u>https://doi.org/10.1007/s42976-023-00376-4</u>.
- Khan, U.M., Rana, I.A., Shaheen, N. R. Maqbool et al. Comparative phylogenomic insights of KCS and ELO gene families in Brassica species indicate their role in seed development and stress responsiveness. Sci Rep 13, 3577 (2023). https://doi.org/10.1038/s41598-023-28665-2.
- Khan, U.M.; Shaheen, N.; Farooq, A.; Maqbool, R.; Khan, S.H.; Azhar, M.T.; Rana, I.A.; Seo, H. Optimization of Regeneration and *Agrobacterium*-Mediated Transformation Protocols for Bi and Multilocular Varieties of *Brassica rapa*. *Plants* 2023, *12*,161. https://doi.org/10.3390/plants12010161.
- 6. Shabbir Hussain, Madiha Habib, Zaheer Ahmed, Bushra Sadia, Amy Bernardo, Paul St. Amand, Guihua Bai, Nida Ghori, Azeem I. Khan, Faisal S. Awan and Rizwana Maqbool. Genotyping-by-Sequencing Based Molecular Genetic Diversity of Pakistani Bread Wheat (Triticum aestivum L.) Accessions. Front. Genet. Volume (13). 772517.

- M. Usman, M. Habib, M. Satish, S. Iqbal, J. Altaf, Z. Amed, A. ur Rahman, A. I. Khan. R. Maqbool, S. Hussain, F. Saleem, Z. Kashif and F.S. Awan (2021). Genomic Characterization of Puccinia triticina using Molecular Marker Technology. Brazilian Journal of Biology, (84), e249472.
- Saleem, S., M. Kashif, R. Maqbool, N. Ahmed and R. Arshad. 2022. Genetic inheritance of stripe rust (*Puccinia striiformis*) resistance in bread wheat breeding lines at seedling and maturity stages. Plants 11(13):1701 (IF = 3.935, ISSN: 2223-7747, https://doi.org/10.3390/plants11131701).
- Hameed A, M. Atiq, S.T. Sahi, N.A. Rajput, Z. Ahmed, M. W. Alam, H. Alsamadany, Y. Alzahrani, S. Sarfraz, J. Altaf, S.A. Awan, **R. Maqbool**, Z.H. Shah, N. Liaqat, M. U. Khan. 2021. Biochemical base of resistance in citrus against canker disease. Pak. J. Agri. Sci., Vol. 58(6), 1857-1865; ISSN (Print) 0552-9034, ISSN (Online) 2076-0906.1DOI: 10.21162/PAKJAS/21.11.
- Muhammad Umer Farooq, Iqra Ishaaq, Celaleddin Barutcular, Milan Skalicky, Rizwana Maqbool, Anshu Rastogi, Sajad Hussain, Suleyman I. Allakhverdiev, Jianqing Zhu, Mitigation effects of selenium on accumulation of cadmium and morpho-physiological properties in rice varieties, Plant Physiology and Biochemistry, Volume 170 (2022) 1-13, ISSN 0981-9428, <u>https://doi.org/10.1016/j.plaphy.2021.11.035</u>.
- 11. Mujahid Alam, Muhammad Kashif, **Rizwana Maqbool** and Nisar Ahmed. (2021). Analyzing the potential of spring wheat (triticum aestivum l.) accessions for water deficit constraint. Pak. J. Agri. Sci., Vol. 58(2), 583-588.
- Shafqat, W., Jaskani, M.J., Maqbool, R., Khan, A.S., Naqvi, S.A., Ali, Z., and Khan, I.A. (2020). Genome Wide Analysis of Citrus sinensis Heat Shock Proteins. Iran. J. Biotechnol. 18: 29–38.
- 13. Shafqat, W., M.J. Jaskani, R. Maqbool, W.S. Chattha, Z. Ali, S.A. Naqvi, M.S. Haider, I.A. Khan, and C.I. Vincent. (2020). Heat shock protein and aquaporin expression enhance water citrus under water deficits conservingbehavior of and high temperature conditions. Environmental and Experimental Botany. 181 (2021)104270, https://doi.org/10.1016/j.envexpbot.2020.104270".
- Shafqat, Waqar, Muhmmad Jafar Jaskani, Rizwana Maqbool, Ahmad Sattar Khan, and Zulfiqar Ali. (2019) "Evaluation of Citrus Rootstocks against Drought, Heat and their Combined Stress Based on Growth and Photosynthetic Pigments." Intl. J. Agric. Biol., 22, (5): 1001-1009.
- 15. Farooq, M.U., Iqra Ishaaq., **Rizwana Maqbool**., and Iqra Aslam. (2019) Heritability, genetic gain and detection of gene action in hexaploid wheat for yield and its related attributes. AIMS Agriculture and Food. 4(1): 56–72.
- Amandeep K. Dhaliwal, Amita Mohan, Gaganjot Sidhu, Rizwana Maqbool, and Kulvinder S. Gill (2015) An Ethylmethane Sulfonate Mutant Resource in Pre-Green Revolution Hexaploid Wheat. Plos One., 10(12): e0145227.

- 17. Sajjad, M., Sultan Khan, and **Rizwana Maqbool** (2015) Pedigree and SSR Data Analysis Reveal Dominant Prevalence of Few Parents in Pedigrees of Pakistani Wheat Varieties. *American Journal of Molecular Biology*, 5, 1-6.
- Muhammad Sajjad, Sultan Habibullah Khan, Rizwana Maqbool, Asma Ather and Nayyer Iqbal (2012) Selection of Pakistani and CIMMYT wheat lines for better grain yield and quality. Int. J. Agric. Biol., 14: 645–649.
- 19. **Rizwana Maqbool**, Muhammad Sajjad, Ihsan khaliq, Aziz ur Rahman, Abdus salam Khan and Sultan Habibullah Khan (2010) Morphological diversity and trait association in bread wheat (*Trititicum aestivum* L.). American-Eurasian J. Agric. & Environ. Sci., 8(2): 216-224.

Book Chapters Published

- Farooq, A., U. M. Khan, A. Riaz, R. Maqbool, Z. Ali, and M. Sajjad. (2024). Chapter 3rd Genomes, Pangenomes, and Super Pangenomes of Cereals: How to Translate the Generated Information into Genetic Gains. In Omics and System Biology Approaches for Delivering Better Cereals. Editors: D. K. Saini, and C. Kole. Boca Raton, CRC Press. ISBN: 9781032693385.
- Ali, A., Z. Ahmed., R. Maqbool., K. Shahzad, A. Hameed, F. Saeed Awan, A. Khan, Z. H. Shah, Z. Ali, H. Alsamadany & M. Bilal. (2022). Advances in Molecular Markers to Develop Soybean Cultivars with Increased Protein and Oil Content. In: Wani, S.H., Sofi, N.u.R., Bhat, M.A., Lin, F. (eds) Soybean Improvement. Springer, Cham. https://doi.org/10.1007/978-3-031-12232-3 6.
- 3. Zaid Ulhassan, Muhammad Umer Farooq, Farwa Basit, Muhammad Mudassir Nazir, Jianqing Zhu, Iqra Ishaaq, Rizwana Maqbool, Khalid Rehman Hakeem, Weijun Zhou, Chapter1 Uptake and translocation mechanisms of metals/metalloids in plants through soil and water, Editor(s): Tariq Aftab, Khalid Hakeem, Metals Metalloids Soil Plant Water Systems, Academic Press, 2022, Pages 1-28, ISBN 9780323916752, https://doi.org/10.1016/B978-0-323-91675-2.00018-4.
- 4. Ali A, Ahmed Z, Maqbool R, Shahzad K, Shah ZH, Ali MZ, Alsamadany H, Bilal M, (2021) Nanobioremediation of insecticides and herbicides, Editor(s): Hafiz M.N. Iqbal, Muhammad Bilal, Tuan Anh Nguyen, Ghulam Yasin, In Micro and Nano Technologies, Biodegradation and Biodeterioration at the Nanoscale, Elsevier, Pp: 655-674, ISBN 9780128239704, https://doi.org/10.1016/B978-0-12-823970-4.00023-3.
- 5. Shafqat, W.; Naqvi, S.A.; Maqbool, R.; Haider, M.S.; Jaskani, M.J.; Khan, I.A. Climate change and citrus. In *Citrus*; Intech Open: London, UK, 2021; 24p.
- 6. Z. Ali., R. Maqbool and Z. Ahmed. (2018). Methods of Breeding Crops. *In*: Khan A.S, Z.Ali, and N. Islam. (Eds.). Plant Breeding. (pp.103-150). Faisalabad: Endowment Fund Secretariat, University of Agriculture Faisalabad
- 7. Z. Ali., R.M. Rana., M. N. Cheema., Z. Ahmed., R. Maqbool., H. Ma and A. A. Khan. (2018). Genomics Based Plant Breeding. *In*: Khan A.S, Z.Ali, and N. Islam. (Eds.). Plant

Breeding. (pp. 209-224). Faisalabad: Endowment Fund Secretariat, University of Agriculture Faisalabad

EVALUATION OF RESEARCH WORK (EXTERNAL EXAMINER)

- i. Viva Voce examination of M. Phil thesis at NIBGE.
- ii. Thesis evaluation as external examiner at GC Women University, Faisalabad.

NEW DEGREE PROGRAM (M.SC IN SEED SCIENCE AND TECHNOLOGY)

i. Member of Curriculum Committee for the discipline of "MS in Seed Science and Technology" constituted vide No. A-4/446/11319 dated 18-02-2016 and successfully obtained the NOC from HEC Pakistan.