Azeem Iqbal Khan

Present Position

Professor, Department of Plant Breeding and Genetics,
University of Agriculture Faisalabad, Pakistan.

Home Address

House# 12/A, Peoples Colony # 1
Faisalabad, Pakistan.
Phone: +92-41-8543212, +92-41-9200161-69/2925, +92 321-7836137

E-mail: ranaazeemiqbal@yahoo.com, azeempgb@hotmail.com

Research Topic	**PostDoc** • QTL mapping for CBB in Dry Beans (University of Guelph, Canada)
	Ph.D • Genetic basis of heat tolerance and other plant traits in upland cotton (Gossypium hirsutum L.)"
Research Topic	**M.Sc (Hons) Agriculture (Plant breeding and Genetics)** • Correlation studies and heritability estimate of some important characters of upland cotton plant.
Education Qualification	• Ph.D (2008) from University of Agriculture, Faisalabad, Pakistan • M.Sc (Hons) Agriculture (Plant breeding and Genetics) 1996 from University of Agriculture, Faisalabad, Pakistan • B.Sc (Hons) Agriculture (Plant breeding and Genetics) 1994 from University of Agriculture, Faisalabad, Pakistan • F.Sc Pre-Medical 1989 from Faisalabad Board of Intermediate and Secondary Education Faisalabad. Pakistan • Matriculation (Science) 1986 from Board of Intermediate and Secondary Education Sargodha. Pakistan

Research Experience	• From March 2022 to date working as Professor in Department of Plant Breeding and Genetics, University of Agriculture Faisalabad. • From May 2013 to March 2022, worked as Associate Professor in Department of Plant Breeding and Genetics, University of Agriculture, Faisalabad. • From February 2004 to May 2013, worked as Assistant Professor in CABB, University of Agriculture Faisalabad. • Three year working experience as **Scientific Officer** in Mutation Breeding Division (Cotton Group) at NIAB. • Two and half year working experience as **Trainee Fellow** in Mutation Breeding Division (Cotton Group) at National Institute for Agriculture and Biology (NIAB) • Ten month working experience in the AgrEvo Pakistan (Pvt) Ltd.
Foreign Training	• Three months training on "Genetic Characterization through Single Nucleotide Polymorphism (SNP) Advanced Molecular Marker Technology" Plant Gene Resources of CANADA, AAFC Saskatoon Research Centre, CANADA. This training grant was provided by HEC Pakistan on competitive basis.
Areas of Research	1. Breeding high yielding cotton varieties for leaf curl disease using molecular and conventional approaches 2. Association mapping in wheat for yield and drought tolerance
Expertise	• DNA Fingerprinting Technologies (RAPD, SSR, SNP), • Population development (F_2, BC and DH), Varietal/ Gene pool development. • QTL mapping, Association mapping, cloning etc
Achievements	**Okra 3A** • Approved variety of okra having tolerance to yellow mosaic virus, longer pod softness period, high yielding and early fruit bearing. • Two cotton Advanced lines PB-93 and Noor-21 are in NCVT and DUS. The lines are compact and heat tolerant **Tomato** • Six advanced and pure lines of Tomato i.e., TPBG-15, TPBG-22, TPBG-80-1, TPBG-90, TPBG-102 and TPBG-122 have been selected for DUS testing next year following Spot examination for varietal approval. The lines are determinate types with high yield and heat tolerance ability.

Research Project

- Quality seed production and supply to the farming community for ensuring food security in Pakistan.
- Member Research Team of the project "Gene Editing of Biological Agents for Nutritional, Biochemical and Therapeutic Purposes" Funded by Ministry of Science and Technology. Worth Part of Total 500 million project
- "Development of fruit and shoot borer resistant Brinjal through incorporation of Cry1Ac gene" Funded agency PSF (shortlisted) worth Rs. 5.05 million
- Development of onion advanced lines with enhanced nutritional quality. Funded by PARB. Worth Rs. 12.55 (shortlisted)
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Research Achievements:

- Developed two cotton varieties, NIAB 111 and NIAB 999.
- First time reported that all the commercially grown cotton varieties are prone to cotton leaf curl virus infection through artificial inoculation (grafting).
- Identified number of highly resistant mutant lines against cotton leaf curl virus (CLCuV-Multan) through artificial inoculation (grafting) and by exposing them to high inoculum pressure by planting in natural hotspots. NIAB-999 and NIAB-111 (*approved for their general cultivation by the Punjab Seed Council during the year 2003-04 and 2004-05 respectively*) are among the identified highly resistant mutants. It is a great break through by the cotton group after the release of NIAB-78, which revolutionized the cotton production in the country.
- Improvement of bottle shoot graft inoculation method for the screening of cotton germplasm against cotton leaf curl virus.
- Development of modified scale for the screening of cotton leaf curl virus disease.
- Evaluation of cotton germplasm through grafting against cotton leaf curl virus Burewala strain (CLCuV-Burewala) and its effect on the yield components & fiber quality of the commercial cultivars.

	• Screening of cotton germplasm against cotton mosaic, bacterial blight, *Alternaria* leaf spots, boll rots and stunting under field conditions and through grafting.

Publications	• Ali, A., Z. Ahmed, R. Maqbool, K. Shahzad, A. Hameed, F.S. Awan**, A.I. Khan**, Z.H. Shah, Z. Ali and H. Alsamadany. 2022. Advances in Molecular Markers to Develop Soybean Cultivars with Increased Protein and Oil Content. *Soybean Improvement: Physiological, Molecular and Genetic Perspectives*. Springer. pp.125–136. • Farooq, A., W.S. Chattha, M.T. Azhar, **A.I. Khan** and A. Shakeel. 2022. Phenotyping for Assessing Genotypic Variation in Phosphorus Use Efficiency. *Sustainable Agriculture Reviews 58: Phosphorus Use Efficiency for Sustainable Agriculture*. Springer. pp.115–136. • Hussain, S., M. Habib, Z. Ahmed, B. Sadia, A. Bernardo, P.S. Amand, G. Bai, N. Ghori, **A.I. Khan**, F.S. Awan and R. Maqbool. 2022. Genotyping-by-Sequencing Based Molecular Genetic Diversity of Pakistani Bread Wheat (Triticum aestivum L.) Accessions. *Front. Genet.* 13:1–14. • Imtiaz, M., A. Shakeel and **A.I. Khan**. 2022. Estimation of genetic effects and interrelationship of morpho-physiological and biochemical attributes for drought tolerance in upland cotton (Gossypium hirsutum L.). *Pakistan J. Agric. Sci.* 59:391-403. (IF = 0.748) • Ali, A., Z. Ahmed, R. Maqbool, K. Shahzad, A. Hameed, F.S. Awan, **A.I. Khan**, Z.H. Shah, Z. Ali and H. Alsamadany. 2022. Advances in Molecular Markers to Develop Soybean Cultivars with Increased Protein and Oil Content. *Soybean Improvement: Physiological, Molecular and Genetic Perspectives*. Springer. pp.125–136. • Zafar, M. M., A. Mana, A. Razzaq, M. Zulfiqar, A. Saeed, M. Kashif, **A. I. Khan**, Z. Sarfraz, H. Mo, M. S. Iqbal, A. Shakeel and M. Ren. 2021. Exploiting agronomic and biochemical traits to develop heat resilient cotton cultivars under climate change scenarios. Agronomy. 11(9): 1-14. • Shafiullah, M., J. Altaf, N. A. Qureshi, S. A. Awan, K. Samiullah, B. Rasool, F. S. Awan and **A. I. Khan.** 2021. Some morphological records onn *Sinanodonta woodiana* and *Lamellidens marginalis* (Mollusca: Bivalvia) from central reaches of Indus river, Pakistan. Pak J. Agri. Sci. 58(3): 967-973

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References	Name: **Prof. Dr. Riaz Hussain Qureshi** **Ex Vice Chancellor, University of Agriculture, Faisalabad, Pakistan** Present Status: Advisor Research and Development Higher Education Commission, Islamabad Email: rqureshi@hec.gov.pk Phone #. +92 300 5071063, +92 51 90400400
	Name: **Professor Hafeez Ahmad Sadaqat** Present Status: Professor, Department of Plant Breeding and Genetics University of Agriculture, Faisalabad, Pakistan. E-mail: drhafeezsadaqat@yahoo.com Phone #. + 92-41-9200161-69/2927, +92 3216603167,