

YAHYA RAUF
Department of Crop and Soil Sciences
Texas A&M AgriLife Research
6500 Amarillo Blvd. W., Amarillo TX 79106
yahya.rauf@ag.tamu.edu

EDUCATION

- 2015- 2019: PhD Applied Plant Sciences (Plant Breeding and Plant Molecular Genetics)
University of Minnesota. USA
Thesis Title: *Genetic relationship of adult plant resistance to wheat rusts and validation of stem rust QTL*
- 2006-2008: Master of Science (M.Sc. Hons) Plant Breeding and Genetics, Arid Agriculture
University, Rawalpindi, Pakistan
Thesis Title: *Morphological and molecular characterization of multiple ovary
wheat germplasm*
- 2001-2005: Bachelor of Science (B.Sc. Hons) in Agriculture-Plant Breeding and Genetics,
Faculty of Agriculture Rawalakot
Thesis Title: *Cytomorphic characterization of different sunflower (*Helianthus
annuus*) varieties for their oil and chlorophyll contents under rainfed conditions*

RESEARCH EXPERIENCE

2022-Present: **Postdoctoral Research Associate, Wheat Genetics, Texas A&M AgriLife
Research, USA**

- Genome-wide association mapping and genomic selection in wheat
- QTL mapping tools, resources, and bioinformatics
- Wheat doubled haploid production for US national collaborators
- Wheat genetics lab management and technical support
- Teaching BIOL 3301-01 Genetics course, West Texas A&M University

2020-2022: **Postdoctoral Fellow, Wheat Genetics Lab, Oklahoma State University, USA**

- Genetic basis and molecular mechanism of flowering time and regrowth habit in perennial wheat.
- RNA, cDNA and gene expression in wheat populations
- Molecular marker development using wheat genomic sequence data
- Gene functionality in wheat through genome editing and over-expression approaches. Applications in wheat breeding programs.
- Population development, insect phenotyping, lab and greenhouse management

2015-2019: **Research Associate Wheat Breeding Program/Cereals Genomics Lab,
University of Minnesota, USA**

- High throughput DNA extraction, genomic libraries for next generation sequencing (GBS), DNA marker deployment, QTL mapping and basic bioinformatics
- Multi-location wheat trials, early generation selection, electronic data collection (KDDart, KDXplore) analysis and reporting
- Collaboration with CIMMYT, Mexico and USDA-ARS Minnesota, and Washington State University for wheat disease phenotyping.

2012-2014: Research Associate, International Maize and Wheat Improvement Center (CIMMYT) Pakistan

- Collaboration with 11 national agriculture research institutes/breeding programs in Pakistan to develop wheat baseline resistance study germplasm for rust phenotyping in field and greenhouses and molecular characterization in Africa and USDA-ARS partners in USA.
- Data management, analysis, and development of recommendations for the national breeding programs
- Framework and protocols for the national research institutes in Pakistan for wheat rusts surveillance and local research capacity development
- Manage material transfer agreements.

2009-2012: Research Associate (wheat breeding) at Barani Agricultural Research Institute, Chakwal Pakistan

- Diverse wheat germplasm evaluation for physiological traits (stomatal conductance, transpiration rate, net photosynthetic rate) using sensor-based instruments.
- Developed and utilized prototypes of hydrometers to test soil moisture profile for drought experiments.
- Macro/micronutrient uptake and utilization efficiency under drought and irrigated conditions

2007-2009: Research Fellow at National Agriculture Research Center, Islamabad Pakistan

- Led a group of 10 people at wheat wide crosses program to maintain genetic stocks and utilization in pre-breeding.
- Screened extensive wheat germplasm for both biotic and abiotic stresses in field and green houses.
- Wheat cytology and doubled haploid production

TEACHING EXPERIENCE

Spring 2023: West Texas A&M University. BIOL 3301-01, Genetics

Fall 2022: West Texas A&M University. BIOL 3301-01, Genetics

Spring 2017: University of Minnesota. AGRO 1101, Biology of Plant Food Systems and the Environment

Fall 2017: University of Minnesota. AGRO 5021, Plant Breeding and Genetics Principles

Guest Lectures:

University of Minnesota: Genetic resistance to disease in crop plants

Oklahoma State University: Gene mapping: Tools and resources

FUNDED RESEARCH PROJECTS

Breed Fusarium Head Blight (FHB) resistance in Hard Winter Wheat via Doubled Haploid. May 2022 to April 2024. USDA-ARS Funding \$49,500. **Co-PI**

Genetic basis and molecular mechanism of flowering time and growth habit in perennial wheat. The Perennial Agricultural Project. Malone Family Land Preservation Foundation and The Land Institute. Total Funding \$166,458.

Funding award for PhD program under the USAID Agricultural Innovation Program. January 2015 to May 2019. Total grant \$200,000. Grant recipient: **Yahya Rauf**

Wheat productivity enhancement program. USDA-ARS. October 2011 to September 2014. Total grant \$3.34 million.

USDA-ARS International Borlaug Fellowship Program. March 2012 to July 2012. Total award \$17,000. Grant recipient: **Yahya Rauf**

Development of nutrient-use-efficient wheat germplasm. Punjab Agricultural Research Board (PARB) funding. July 2009 to May 2012. Total grant PKR10 million.

PROFESSIONAL TRAININGS

2020: **National Faculty Development Program (National Academy of Higher Education)**

- Effective teaching, course design and policies, Lesson planning and learning activities, Lesson delivery
- Research genesis, Research impact, Writing proposals, Scholarly writing

2012: **Basic Wheat Improvement Course (CIMMYT-Mexico)**

- Spring bread wheat breeding for biotic and abiotic stresses
- Implementation of modified bulk method as wheat breeding strategy
- Developmental procedures of international wheat nurseries

University of Minnesota (St. Paul-Minnesota)

- Stem Rust race analysis in USDA-Cereal Disease Laboratory
- Screening of International wheat germplasm at seedling stage against the US stem rust races and recording of stem rust data under field conditions.

Washington State University (Pullman Washington)

- Race analysis and field reactions of stripe rust
- Data recording of stripe rust on Pakistani wheat lines in field

Kenya Agricultural Research Institute (Njoro)

- Evaluation of International wheat nurseries for stem rust Ug99 and stripe rust field resistance

2009: International Centre for Agricultural Research in Dry Areas

- Learned the land and water resources management under integrated watershed development for food security and sustainable improvement of livelihoods.

AFFILIATIONS

- Crop Science Society of America (CSSA)
- American Society of Agronomy (ASA)
- National Association of Plant Breeders (NAPB)

SERVICES

- Secretary early career working group, National Association of Plant Breeders
- Peer reviewer: The Plant Genome, Crop Science, The Crop Journal, Molecular Breeding
- Judging oral and poster presentation competition at CSSA-ASA-SSSA meeting

AWARDS/HONOURS/CERTIFICATES

2019	H. K. Hayes fellowship award, Department of Agronomy and Plant Genetics, University of Minnesota
2018	Norman and Cynthia Engelbrecht fellowship, Department of Agronomy and Plant Genetics, University of Minnesota
2018	Travel fellowship award to attend Borlaug Global Rust Initiative (BGRI) workshop in Morocco under Delivering Genetic Gains in Wheat (DGGW) led by Cornell University.
2017	Monsanto Graduate Student Mentorship Program fellow
2017	Applied Plant Sciences conference travel fellowship award
2016	Rahr fellowship award from Department of Agronomy and Plant Genetics, University of Minnesota
2015	Applied Plant Sciences training travel fellowship award
2015	Deon and Judy Stuthman fellowship award from Department of Agronomy and Plant Genetics, University of Minnesota
2014	PhD fellowship award (USAID- UC Davis)
2013	Certificate of participation in International Plant Breeding Congress, Antalya, Turkey
2012	USDA International Borlaug fellowship award

- 2012 Certificate by University of Minnesota in recognition of successful completion of Wheat Rust Training Course
- 2012 Certificate by CIMMYT in recognition of successful completion of hands-on training course on standardization of rust note taking in Kenya.
- 2012 Certificate of Honor for successful completion of Wheat Improvement Training Course at CIMMYT, Mexico
- 2011 Certificate for participation in the international science conference at Faculty of Agriculture, Rawalakot

PUBLICATIONS

Zhen, W., S. Dhakal, S. Wang, **Y. Rauf**, S. Yu, F. Maulana, W. Huang, J. D. Anderson, X. Ma, J. Rudd, A. Ibrahim, Q. Xue, D. Hays, A. Bernardo, P. St. Amand, G. Bai, S. Baker, J. Baker, S. Liu, and M. Cerit. 2022. QTL mapping of yield components and kernel traits in wheat cultivars TAM 112 and Duster. *Front. Plant Sci.* 13:1057701. [doi: 10.3389/fpls.2022.1057701](https://doi.org/10.3389/fpls.2022.1057701)

Wu, J., L. Qiao, Y. Liu, B. Fu, R. Nagarajan, **Y. Rauf**, H. Jia, and L. Yan. 2022. Rapid identification and deployment of major genes for flowering time and awn traits in common wheat. *Front. Plant Sci.* 13:992811. [doi: 10.3389/fpls.2022.992811](https://doi.org/10.3389/fpls.2022.992811)

Rauf, Y., P. Bajgain, M.N. Rouse, K. Khanzada, S. Bhavani, R. P. Singh, J. Huerta-Espino, M. Imtiaz, and J. A. Anderson. 2022. Molecular characterization of adult plant resistance to stem rust in a spring wheat mapping population. *Plant Disease*, 106, 439–450. <https://doi.org/10.1094/PDIS-03-21-0672-RE>

Rauf, Y., Caixia Lan, Mandeep S. Randhawa, Ravi P. Singh, Julio Huerta-Espino and J. A. Anderson. 2022. Quantitative trait loci mapping reveals the complexity of adult plant resistance to leaf rust in spring wheat ‘Copio’. *Crop Science*. 1-14.

Min F., X. Zhang, R. Nagarajan, W. Zhai, **Y. Rauf**, H. Jia, Z. Ma, L. Yan. 2022. Natural variants and editing events provide insights into routes for spike architecture modification in common wheat. *The Crop Journal*, ISSN 2214-5141. <https://doi.org/10.1016/j.cj.2022.04.009>

M.U. Rehman, S. Gale, G. Brown-Guedira, Y. Jin, D. Marshall, L.W. Whitcher, S. Williamson, M. Rouse, J. Ahmad, G. Ahmad, I. A. Shah, M.A. Sial, **Y. Rauf**, A. R. Rattu, J. I. Mirza, R. Ward, M. Nadeem, Ghulam Ullah and M. Imtiaz. 2020. Identification of seedling resistance to stem rust in advanced wheat lines and varieties from Pakistan. *Crop Sci.* 2020;1–8.

M.U. Rehman, S. Gale, G. Brown-Guedira, Y. Jin, D. Marshall, L.W. Whitcher, S. Williamson, M. Rouse, S. Bahavni, M. Hussain, G. Ahmad, M. Hussain, M.A. Sial, J.I. Mirza, **Y. Rauf**, A.R. Rattu, M. Qamar, K. A. Khanzada, A. Munir, R. Ward, R. P. Singh, H. Braun and M. Imtiaz. 2018. Adult plant resistance to stem rust (*Puccinia graminis f. sp. tritici*) in Pakistani advanced lines and wheat varieties. *Aust. J. Crop Sci.* 12(10) 1633-1639.

Rauf, Y., A. Subhani, M. S. Iqbal, M. Tariq, A. Mahmood, and M. K. N. Shah. 2013. Screening of wheat genotypes for drought tolerance based on drought related indices. *SABRAO J. of Breeding and Genetics*. 45 (2) 255-263.

Mujeeb-kazi, A. Gul, I. Ahmad, M. Farooq, **Y. Rauf**, A. ur Rahman and H. Riaz. 2009. Genetic resources for some wheat abiotic stress tolerances. In: M. Ashraf et al., (eds) *Salinity and water stress improving crop efficiency*. V.44. Ch.16. pp. 149-163.

In review/Progress manuscripts:

Rauf, Y., P. Bajgain, M. N. Rouse, S. Bhavani, W. D. Bulbula and J. A. Anderson. 2022. Validation and complementary gene action of 2B stem rust QTL with *Sr2* gene for effective resistance. In progress.

CONFERENCES/WORKSHOPS

Rauf, Y., Parker, K., Wang, Z., Rudd, J. C., Xue, Q., Ibrahim, A. M. H., Baker, J. A., Baker, S., & Liu, S. (2022) Association Mapping for Seed Traits and Biomass in Wheat Doubled Haploid Lines [Abstract]. ASA, CSSA, SSSA International Annual Meeting, Baltimore, MD.

<https://scisoc.confex.com/scisoc/2022am/meetingapp.cgi/Paper/145757>

Wang, Z., Dhakal, S., Cerit, M., **Rauf, Y.**, Chu, C., Wang, S., Xue, Q., Rudd, J. C., Ibrahim, A. M. H., Baker, J. A., Baker, S., & Liu, S. (2022) QTL Mapping of Yield Components in Wheat Cultivars TAM 112 and Duster [Abstract]. ASA, CSSA, SSSA International Annual Meeting, Baltimore, MD. <https://scisoc.confex.com/scisoc/2022am/meetingapp.cgi/Paper/144928>

Wang, Z., Yu, S., Dhakal, S., Parker, K., **Rauf, Y.**, Chu, C., Wang, S., Xue, Q., Rudd, J. C., Ibrahim, A. M. H., Hays, D., Baker, J. A., Baker, S., & Liu, S. (2022) Improving Wheat Production and Quality through Genome-Wide-Association-Study of Synthetic Derived Wheat Lines [Abstract]. ASA, CSSA, SSSA International Annual Meeting, Baltimore, MD.

<https://scisoc.confex.com/scisoc/2022am/meetingapp.cgi/Paper/144926>

Rauf, Y., K. Parker, Z. Wang, J. Rudd, Q. Xue, A. M. H. Ibrahim, J. Baker, S. Baker, S. Liu. 2022. Association Mapping for Seed Traits and Biomass in Wheat Doubled Haploid Lines. *National Association of Plant Breeding* (P. 79), Iowa State University, August 8-11, 2022.

Zhen, W., C. Chu, Y. Xu, **Y. Rauf**, K. Parker, S. Yu, M. Cerit, Q. Xue, J. Rudd, A. M. H. Ibrahim, P. S. Amand, G. Bai, D. Hays, J. Baker, K. Jessup, S. Baker, K. Hui, and S. Liu. 2022. Map-based cloning of a QTL for kernel weight on chromosome arm 2BS in wheat cultivar 'TAM 111'. *National Association of Plant Breeding* (P. 59), Iowa State University, August 8-11, 2022.

Rauf, Y., C.X. Lan, R. P. Singh, M. N. Rouse, M. Imtiaz, and J. A. Anderson. 2018. Potentially unique sources and their genetic relationship of adult plant resistance to wheat rusts. *Proceedings 4th Canadian Wheat Symposium* (P. 40), November 19-22, 2018, Winnipeg, Canada.

Rauf, Y., C.X. Lan, Bajgain, P., R. P. Singh, M. N. Rouse, M. Imtiaz, J. A. Anderson. 2018. Preliminary investigations on the genetic relationship of adult plant resistance to wheat rusts in COPIO. *Borlaug Global Rust Initiative workshop*. Marrakech, Morocco.

M.U. Rehman, S. Gale, M. Rouse, Y. Jin, **Y. Rauf**, A.R. Rattu, J.I. Mirza, R. Ward and M. Imtiaz. 2015. Seedling resistance to stem rust races in Pakistani wheat landraces. *Borlaug Global Rust Initiative workshop*. Sydney. Australia.

M.U. Rehman, M. Hussain, J. Ahmad, G. Ahmad, I.A. Shah, **Y. Rauf**, J.I. Mirza, M.M. Javaid, S. Masood and M. Imtiaz. 2015. Adult plant resistance to leaf and stripe rust in landraces. *Borlaug Global Rust Initiative workshop*. Sydney. Australia.

Rauf, Y., P. Olivera, M. N. Rouse, Y. Jin, R. Ward and M. Imtiaz. 2014. Seedling stem rust responses of Pakistani wheat varieties. *Borlaug Global Rust Initiative workshop*, Cd. Obregon, Mexico.

Rauf, Y., P. Olivera, G. Brown-Guedira, D. Marshall, M. N. Rouse, Y. Jin, S. Bhavani, R. P. Singh, M.Y. Mujahid, R. Ward and M. Imtiaz. 2013. Assessment of host plant resistance to stem rust in Pakistani wheat germplasm. *International Plant Breeding Congress*, 10 to 14 November 2013, Antalya, Turkey.

Rattu, A., M. Fayyaz, A. Munir, J.I. Mirza, K.A. Khanzada, M. Imtiaz, **Y. Rauf**, Y. Mujahid, I. Ahmad, R. Ward, I.A. Shah, F. Muhammad and S.A. Khan. 2013. Virulence Spectrum of Wheat Rusts in Pakistan during 2012-13. *Borlaug Global Rust Initiative*, New Dehli. India.

Mirza, J., A. Rattu, M. Fayyaz, K. A. Khanzada, A. Munir, M. Imtiaz, **Y. Rauf**, Y. Mujahid, I. Ahmad, R. Ward, I. A. Shah, N. Ahmad, Ihtamullah, F. Muhammad, S. A. Khan, M. A. Hussain, M. Hussain and N. Ahmad. 2013. Current status of stem rust virulence in Pakistan. *Borlaug Global Rust Initiative*, New Dehli. India.

Mirza, J., A. Rattu, M. Fayyaz, K. A. Khanzada, A. Munir, M. Imtiaz, **Y. Rauf**, Y. Mujahid, I. Ahmad, R. Ward, I. A. Shah, N. Ahmad, Ihtamullah, F. Muhammad, S. A. Khan, M. A. Hussain, M. Hussain and N. Ahmad. 2013. Status of Yellow rust and its virulence patterns in Pakistan. *Borlaug Global Rust Initiative*, New Dehli. India.

Mirza, J., A. Rattu, M. Fayyaz, K. A. Khanzada, A. Munir, M. Imtiaz, **Y. Rauf**, Y. Mujahid, I. Ahmad, R. Ward, I. A. Shah, N. Ahmad, Ihtamullah, F. Muhammad, S. A. Khan, M. A. Hussain, M. Hussain and N. Ahmad. 2013. Response of wheat cultivar Seher-06 to Leaf rust virulence in Pakistan- A major concern. *Borlaug Global Rust Initiative*, New Dehli. India.

Subhani, A., M. Tariq, R. Latif, **Y. Rauf** and A. Mahmood. 2012. Cropping system influence on planting water content and yield of winter wheat and chickpea under rainfed conditions. *14th National Congress of Soil Science*, 12-15 March 2012, Expo Centre, Lahore-Pakistan.

Subhani, A., M. Tariq, A. Mahmood, S. Ahmad and **Y. Rauf**. 2012. Effect on cotton quality grown under hot and mild conditions of Multan and Chakwal. A paper presented in the *14th National Congress of Soil Science*, 12-15 March 2012, Expo Centre, Lahore-Pakistan.

Rauf, Y., A. Subhani, M. Tariq and R. Latif. 2012. Genetic resource utilization for bio-fortification in wheat crop. A paper presented in the *14th National Congress of Soil Science*, 12-15 March 2012, Expo Centre, Lahore-Pakistan.

Latif, R., A. Subhani, M. Tariq, A. R. Jami and **Y. Rauf**. 2012. Fertilizer requirements of promising wheat lines under medium rainfed conditions A paper presented in the *14th National Congress of Soil Science*, 12-15 March 2012, Expo Centre, Lahore-Pakistan.

Rauf, Y., M. Tariq, A. Subhani and A. Mahmood, 2011. Development of nutritionally enhanced wheat germplasm to combat malnutrition. *International Conference on Prospects & Challenges to Sustainable Agriculture*, 14-16 July 2011, Faculty of Agriculture, Rawalakot.

Mahmood, A., **Y. Rauf**, M.A. Mian, M. Ihsan, A. Subhani. 2010. Effect of high temperature on wheat genotypes at pre and post anthesis stages. *13th National Congress of Soil Science*, 24-27 March 2010, Faisalabad-Pakistan.

Mahmood, A., M. Imran, A. Subhani, and **Y. Rauf**. 2010. Response of wheat genotypes against salinity and sowing depths. *13th National Congress of Soil Science*, 24-27 March 2010, Faisalabad-Pakistan.

Mahmood, A., A. Subhani, M. B. Khokhar, M. Koukab, M. A. Mian and **Y. Rauf**. 2010. Response of wheat genotypes to moisture stress for seed germination by using PEG. *13th National Congress of Soil Science*, 24-27 March 2010, Faisalabad-Pakistan.

Mahmood, A., A. Subhani, **Y. Rauf**, and M. B. Khokhar. 2010. Screening of nutrient use efficient wheat germplasm under different fertility and moisture regimes. *13th National Congress of Soil Science*, 24-27 March 2010, Faisalabad-Pakistan.

Mahmood, A., A. Subhani, and **Y. Rauf**. 2010. Development of nutrient use efficient wheat lines under drought and irrigated conditions at different fertilizer levels. *International Science Conference*, 21-23 July 2010, Faculty of Agriculture, Rawalakot.