Jeanie Borlaug Laube Women in Triticum Award

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Early Career Award & Mentor Award

BGRI

Borlaug Global Rust Initiative

The Borlaug Global Rust Initiative (BGRI) administers the Jeanie Borlaug Laube Women in Triticum (WIT) Awards and WIT Mentor awards. This global community of over 1,000 wheat and rust scientists is working to systematically reduce the world's vulnerability to stem, yellow, and leaf rusts of wheat. Initiated in 2005 under the leadership of Norman E. Borlaug, the BGRI aims to create a sustainable international system to contain the threat of wheat rusts and facilitate enhancements in wheat productivity.

The Borlaug Global Rust Initiative is committed to developing the young professional careers of highly educated women who work in Triticum or its relatives. By fostering the careers of women working in the fields of wheat breeding and pathology, we can advance Norman Borlaug's vision of a more secure wheat crop worldwide, and enhance the global community of wheat and scientists in a meaningful way. The bridge to a food-secure world will be built by both men and women.

Jeanie Borlaug Laube, *Chair of the BGRI*

BGRI
Borlaug Global Rust Initiative

2010 AWARDEES

Esraa Alwan, from Syria, completed an MSc under the supervision of Francis Ogbonnaya at ICARDA, in association with Aleppo University, in Syria. Her research focused on finding new sources of stem rust resistance in wild tetraploid wheat. She is currently earning her PhD from Washington State University where she focuses on the identification and characterization of new sources of resistance to stripe rust and Hessian fly, using linkage maping, QTL mapping, and genome-wide association approaches.

Hale Ann Tufan, from Turkey, completed her PhD at the John Innes Centre, and worked for CIMMYT, University of East Anglia School of International Development. Her current work focuses on building gender responsive agricultural research systems as principle investigator of the Gender-responsive Researchers Equipped for Agricultural Transformation (GREAT) project, and leading the participatory breeding and gender research work with the NextGen Cassava Breeding project, both through Cornell University.

Jemanesh Kifetew Haile, from Ethiopia, earned a PhD working with Marion Roder at the Leibniz Institute of Plant Genetics & Crop Plant Research, in Germany. Currently, she is a research officer in the Wheat Breeding and Genetics group of the Department of Plant Sciences, University of Saskatchewan, Saskatoon, Canada, where her work focuses on genomic selection and germplasm screening for Fusarium head blight resistance and other important diseases of wheat in Canada

Jessica Rutkoski, from the U.S., finished her PhD in the laboratory of Mark Sorrells at Cornell University, and then became an assistant professor at Cornell and adjunct associate scientist at CIMMYT, working on integrating genomic selection and high-throughput phenotyping to predict breeding values for yield in wheat. Jessica now leads the quantitative genetics cluster at IRRI where her research focuses on improving rice breeding efficiency and dissecting genetic and agronomic trends from historical data to monitor breeding program effectiveness.

Maricelis Acevedo, from Puerto Rico, U.S., is currently the associate director for science for the Delivering Genetic in Wheat project at Cornell University. At the time of her award, she was a post-doctoral fellow at the USDA-ARS Cereal Disease Lab, where she screened wheat landraces from the USDA collection for new sources of stem rust resistance in Njoro, Kenya. Maricelis was cereal rust pathologist and assistant professor at North Dakota State University from 2010-2016.

2011 AWARDEES

Awatif Abd El Lateef Farag Alla, of Sudan, is an assistant professor in the Department of Crop Science at the University of Bahri. She conducted her PhD research in plant breeding, genetics, and physiological dissection of heat tolerance at ICARDA in Syria, under the guidance of Francis Ogbonnaya and Osman S. Abdalla, supervised by Mahmoud Fadlalmoula. Awatif also supervises projects on the performance of bread wheat varieties at al-Kadaro conditions and is the director of quality and development at Bahri.
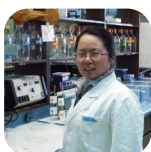
Caixia Lan, from China, earned her PhD in 2010 in crop genetics and breeding from the Institute of Crop Science at the Chinese Academy of Agricultural Sciences. From 2011 until 2018, she focused on adult plant resistance to wheat rusts as a scientist with the Global Wheat Program at CIMMYT in Mexico. In 2018, she became a full professor at Huazhong Agricultural University in Hubei Province, China, where she will conduct research on wheat breeding and rust genetics.

Ida Paul, from South Africa, was Program Manager of Crop Protection at the Agricultural Research Council Small Grain Institute at the time of her award. Today, she manages her own consulting firm in South Africa, working as a crop health consultant and science writer, agricultural radio host, and conducting workshops on wheat disease identification and control.

Silvia Barcellos Rosa, a native of Brazil, earned her PhD on leaf rust resistance at the University of Manitoba, Winnipeg, and developed her research at Agriculture and Agri-Food Canada, Cereal Research Centre. Silvia currently works as a spring wheat breeder at CÉROM, Centre de Researche sur les Grains, in Québec, Canada.

Stephanie Walter, from Germany, is a post-doctoral researcher in Mogens Hovmøller's group at Aarhus University in Denmark, where she is working to dissect the genome of stripe rust and discover effectors that play a key role in the interaction between the wheat host and the stripe rust pathogen.

2012 AWARDEES

Victoria (Tori) Valdez, from the U.S., is a research associate in Scott Haley's lab at Colorado State University. She is responsible for the integration of TILLING mutants including mutation stacking, background purification and phenotypic evaluations.

Yukiko Naruoka, from Japan, was a post-doctoral researcher at Washington State University focused on identifying novel stripe rust resistant genes and molecular markers for known genes using various winter and spring wheat materials in the U.S. Pacific Northwest. Today, Yukiko is a spring wheat breeder at Syngenta, based in Glyndon, Minnesota, whose responsibility is to develop and evaluate spring wheat lines in conventional and hybrid wheat breeding programs targeting the Northern Plains. She uses new tools and technologies for molecular and genomic selection, data integration and analytic programs in addition to traditional breeding.

Lida Derevnina, ffrom Australia, earned her PhD in plant breeding and pathology at the University of Sydney under the supervision of Robert Park. She is currently a Marie Curie Fellow at The Sainsbury Laboratory, Norwich, UK, working with Sophien Kamoun. Her research aims to improve our understanding of resistance gene function and the mechanisms that pathogens use to hamper them. She was previously a postdoctoral fellow in the Michelmore Lab, at UC-Davis, working in comparative genomics.

Joanna Risk, from New Zealand, completed her post-doctoral fellowship with Evans Lagudah at the CSIRO Plant Industry in Canberra, Australia. She returned to New Zealand and, while raising her two boys, has recently completed a certificate in Sustainable Nutrient Management in NZ Agriculture, Massey University.

Maria Newcomb, from the U.S., worked as a post-doctoral plant pathologist in Yue Jin's research program at the USDA-ARS Cereal Disease Laboratory in Minnesota. Currently, she is an assistant research scientist in Plant Sciences at the University of Arizona. She focuses on plant phenomics and field phenotyping. Her previous experience is in plant disease epidemiology and the ecology of plant-microbe interactions.

2013 AWARDEES

Arti Singh, from India, was a post-doctoral fellow at the Semiarid Prairie Agricultural Research Centre, Agriculture and Agri-Food Canada at the time of her award. Today, she is an adjunct assistant professor in the Department of Agronomy at Iowa State University. Her research focuses on legume breeding, utilization of advanced data analytics, particularly machine and deep learning for plant stress phenotyping, and genetic/genomic studies on abiotic and biotic stress resistance on soybean and mung bean.

Kaori Ando, from Japan, holds a PhD in plant breeding and genetics/horticulture from Michigan State University. She is currently a Research Geneticist (Postdoc) at the USDA-ARS Crop Improvement and Protection Unit in Salinas, CA, where her research focuses on developing diagnostic markers from fungal and virus disease resistance QTLs for marker-assisted breeding in melon. She is interested in using molecular tools to facilitate pre-breeding and trait development.

Rola El Amil, from Lebanon, is an associate researcher at the Lebanese Agricultural Research Institute. She did her PhD with Claude De Vallavieille, INRA France, and Kumarse Nazari, ICARDA, focusing on the effect of temperature and host on yellow rust in the Middle East. Currently Rola is working on wheat rust monitoring, epidemiology and disease resistance.

Sandra Margarita Dunckel, of Swiss and Argentinean origin, is working as wheat breeder and biotechnology lead for LongReach Plant Breeders. She has been breeding wheat for Australia since September 2016, transforming the breeding program by implementing genomic selection and high-throughput phenotyping to deliver new and improved varieties to Australian farmers more quickly.

2014 AWARDEES

Samia Berraies, from Tunisia, was a PhD student in biology and genetics at the University of Science of Tunis where her research focused on genetic resistance to leaf rust and septoria trtici blotch, particularly in the identification of molecular markers associated with quantitative trait loci of resistance. Currently she is a postdoc at Agriculture and Agri-Food Canada.

Sarah Battenfield, U.S., is the lead wheat breeder for the Central Plains of the USA for AgriPro Wheat, Syngenta, releasing hard red winter wheat varieties and working toward the launch of hybrid wheat. She received her PhD from Kansas State University (KSU) in 2015. At KSU she held a Monsanto Beachell-Borlaug International Scholars fellowship that allowed her to conduct genomic selection for wheat quality in both CIMMYT and KSU applied wheat breeding programs.

Anna Berlin, Sweden, is an agronomist with a PhD in plant pathology from the University of Agricultural Sciences (SLU), Sweden. She is working in the Department of Forest Mycology and Plant Pathology, at SLU, Uppsala. Most recently she was the lead author on a paper reporting an unusually intense stem rust attack in the wheat fields of Sweden, with initial indications that it is a sexual population emerging from barberry. The last major stem rust outbreak reported in Sweden was 67 years ago.

Naeela Qureshi, Pakistan, is working as a research plant pathologist at the Barani Agricultural Research Institute, Chakwal, Pakistan. She received her MSc (Hons.) in Plant Pathology from University of Arid Agriculture, Rawalpindi, Pakistan, in 2007. After her Master's program, Qureshi served as Plant Pathologist in the private sector for the production of hydroponically grown vegetables.

Chhavi Tiwari, India, is a research associate in the HarvestPlusWheat project at Banaras Hindu University (BHU), India. She received her PhD (Agriculture) in Genetics and Plant Breeding from BHU in 2012. Chhavi's research focuses on the molecular aspects of terminal heat stress that greatly impacts wheat production and grain security in India. Additionally she conducts research in wheat biofortification to address malnutrition problems globally. Since winning the WIT award she has begun developing projects based on training women farmers in wheat research to improve their socioeconomic status.

Banchgize Getie Temesgen, Ethiopia, is a PhD student at the University of Sydney, Plant Breeding Institute, Australia, focused on cereal rust pathology and genetics. She received her MSc from Haramaya University, Ethiopia in 2009. Banchgize's research focuses on identification and characterization of resistance genes to wheat rust pathogens using genetic studies and molecular markers.

2015 AWARDEES

Philomin Juliana, India, received her PhD from Mark Sorrells' lab at Cornell. A wheat breeder at the International Maize and Wheat Improvement Center (CIMMYT), she is evaluating innovative technologies for accelerating the rate of genetic gain in wheat. Philomin's research involves identifying efficient strategies and the appropriate stage for implementing genomic selection and high-throughput phenotyping in CIMMYT's bread wheat breeding program. Given the numerous challenges facing wheat, Philomin aspires to combat them with her research, determination and perseverance.

Shideh Mojerlou, from Iran, received her PhD in plant pathology from Tarbiat Modares University, Tehran, in 2014, where she has since joined the faculty as a lecturer. Shideh is interested in exploring plant disease epidemiology as well as the genetic, cytological and molecular basis of resistance to host and non-host fungi in important crop plants in order to employ the genes to achieve disease resistant cultivars, reduce yield loss and prepare to meet the food needs of a hungry world. Her research foci include the genetics of stem rust resistance in Iranian wheat landraces as well as non-host resistance of barley to wheat stripe rust. Shideh has a keen interest in plant resistance breeding because she believes it is the most cost effective way to protect crops and minimize the risk of epidemics.

Kerri Neugebauer, U.S., is currently a research plant pathologist with the USDA-ARS in Aberdeen, Idaho. While obtaining her PhD at Kansas State University, Kerri focused on identifying and silencing wheat genes that are essential for leaf rust infection in order to obtain durable resistance. In her current post-doctoral position, Kerri is identifying novel sources of resistance to wheat stem rust in the USDA National Small Grains Collection with an emphasis on the devastating Ug99 race group. Kerri hopes to play a role enabling farmers globally to sustain their livelihoods and ensure a stable food supply for future generations.

Kathryn Turner, U.S., is currently the Crop Protection Geneticist at The Land Institute in Kansas where she first became interested in plant breeding as an intern in 2005. Today, she researches plant pathogens and disease defenses in perennial grain crops under development. In earning her MS (2012) and her PhD (2015) from the University of Minnesota, she worked with the Ug99 stem rust race family, Fusarium head blight, and leaf rust, utilizing techniques like association mapping to facilitate durable genetic resistance.

2016 AWARDEES

Irum Aziz, Pakistan, is a PhD student at the University of Sydney concentrating on the biofortification of wheat. She earned her graduate degree (MSc Hons) in Plant Breeding & Genetics from the University of Agriculture, Faisalabad, Pakistan. Aziz is particularly interested in helping women farmers improve their livelihoods and increasing the number of female agricultural researchers in Pakistan.

Mitaly Bansal, India, is currently working as research associate in Punjab Agricultural University, India. Her research focuses on developing tools to deploy rust resistance genes from wild wheat to commercial cultivars. She received the Monsanto Beachell-Borlaug scholarship in 2013.

Elfinesh Shikur Gebremariam, Ethiopia, received her PhD in Plant Pathology from Ankara University, Turkey in 2015. Her PhD work focused on national surveys of wheat crown rot in Turkey. Her goal is to bring that knowledge to similar research in Ethiopia. Elfinesh was a Borlaug LEAP Fellow in 2013. She is back in Ethiopia and working at Hawassa University.

Mercy Wamalwa, Kenya, is a PhD student and assistant lecturer at Egerton University, Kenya, focusing on the characterization of stripe rust isolates in Kenya and mapping resistance genes in wheat. She earned her graduate degree in plant breeding and was named an AWARD fellow in 2014. She recently won an ABCF 2017 Fellowship working with an Ethiopian fellow at ILRI BecA on association and diversity studies of East African wheat using functional KASP assays.

Amy Watson, New Zealand, is a PhD student in Plant Breeding and Genetics at the University of Queensland, Australia. She is studying combining genomic selection and rapid generation advances using controlled conditions known as "speed breeding," which enables up to six generations per year in spring wheat.

2017 AWARDEES

Margaret Krause, U.S., completed her undergraduate degree in 2014, and began PhD studies with Mark Sorrells and Michael Gore at Cornell, where she is a National Science Foundation Graduate Research Fellow. Currently, Margaret is serving as a U.S. Borlaug Fellow in Global Security at CIMMYT in Mexico where she works with the Bread Wheat Breeding Program to evaluate selection methods that utilize aerial images collected from airplanes and drones.

Sarrah Ben M'Barek-Ben Romdhane, from Tunisia, completed her PhD in Plant Pathology at Wageningen University and Research Centre, The Netherlands under Gert Kema. Sarrah later joined the Biotechnology Center of Borj Cédria, Tunisia, as a researcher/ assistant in the Laboratory of Molecular Plant Physiology. Since 2015, Sarrah has become an active member of the Wheat-CRP Tunisia-Septoria Precision Phenotyping Platform led by CIMMYT. In 2017, Sarrah joined the Regional Field Crop Research of Beja. She also manages lab activities at the Septoria Platform Laboratory.

Ritika Chowdhary, from India, is a plant physiologist and biotechnologist pursuing her PhD at the University of Sydney where she is an ACIAR, JAF PhD scholar, under the supervision of Richard Richards and Greg Rebetzke, of the Commonwealth Scientific and Industrial Research Organization and Prof. Richard Trethowan, University of Sydney, with the help of Dr. Ravish Chatrath, Dr. Sai Parshad and Dr. Satish Mishra. Ritika is keenly interested in plant physiology and its integration with breeding and biotechnology and would like to explore this interaction at a practical level.
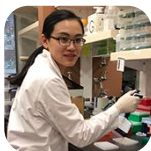
Weizhen Liu, from China, completed her PhD in Crop and Soil Sciences at Washington State University in July 2016. Her research was to identify and characterize resistance wheat germplasm and resistance genes against stripe rust of wheat by genome-wide association mapping and QTL mapping in tetraploid and hexaploid wheat. Since July 2017, she has been a postdoc at Cornell University and is participating in development of a fluorescent nanoparticle sensor to in situ to measure real-time leaf water potential.

Tine Thach, Denmark, completed her PhD in plant pathology at Aarhus University, under Mogens Hovmøller. Currently, Tine is a new mother as well as a postdoctoral researcher at GRRC and part of a public-private partnership with a Danish breeding company. Tine has experience with plant pathology from collaborations with Nordic Beet Research A/S, Denmark, BASF A/S, Germany, and the Department of Primary Industries, Victoria, Australia.

2018 AWARDEES

Radhika Bartaula, from Nepal, is a plant geneticist pursuing her PhD at the University of New Hampshire under Iago Hale. In research supported by the Durable Rust Resistance in Wheat and Delivering Genetic Gain in Wheat projects, she is working to unravel the genetic mechanism resistant to the wheat stem rust pathogen in barberry, the pathogen's sexual host. This project integrates her two main research interests, namely: 1) Developing durable disease resistance strategies based on an improved understanding of host-pathogen interactions, and 2) Improving a staple crop by utilizing genetic diversity beyond traditional primary or secondary gene pools.

Sreya Ghosh Sreya, from India, is a PhD candidate working under the guidance of Brande Wulff at the John Innes Centre (JIC), in the UK, where she focuses on understanding and exploiting genes controlling resistance to leaf rust in wheat. Sreya completed her Bachelor's in Technology at the National Institute of Technology in Durgapur, India, with a major in Biotechnology in 2015. A final year internship at the Max Planck Institute for Plant Breeding Research in Cologne, Germany, instilled a desire to work in crop science. She joined Wulff's lab in 2015 as an intern to experience wheat research before commencing her PhD.

Meriem Aoun, from Tunisia, received her bachelor degree in agricultural engineering at the Agronomic Institute of Chott Meriem, Tunisia, and her MS in Genetics and Plant Biotechnology at the Mediterranean Agronomic Institute of Chania, Greece. She pursued her PhD in Plant Pathology at North Dakota State University, U.S., where she worked to identify sources of rust resistance in durum wheat and understand the virulence and genetic diversity in wheat leaf rust pathogen (*Puccinia triticina*). Meriem recently joined Rebecca Nelson's lab at Cornell University to research maize pathology to mitigate the effects of ear rot pathogens on crop yield and human health.

Raheela Rehman, from Pakistan, is a PhD candidate in the Molecular Biology, Genetics and Bioengineering Program of Sabanci University in Turkey. Upon completion of her MS in Plant Breeding and Genetics, she joined the National Agricultural Research Centre, Pakistan, as scientific officer in the Wheat Breeding Program and simultaneously has been involved in different research projects of CIMMYT, ICARDA, and USDA-ARS. In her doctoral research, she conducts studies for better understanding and characterization of differences in root absorption and translocation of zinc in wheat and maize plants and also in various wheat genotypes from Pakistan developed by HarvestPlus with high grain zinc concentrations.

Hannah Robinson, from Australia, recently completed her PhD in cereal crop genetics at the Queensland Alliance for Agriculture and Food Innovation within the University of Queensland. Funded by the Grains Research and Development Corporation in Australia, her PhD investigated the plant's hidden half: roots, and their potential to improve stability of crop production in water-limited environments. The outcomes of this research have recently been published in the international peer-reviewed journal *Molecular Plant*. Recently, Hannah has embarked on the next stage of her career as a research scientist with InterGrain where she engages with researchers throughout Australia and across the globe to develop research projects aimed at improved wheat and barley production.

2019 AWARDEES

Sanu Arora, from India, is a group leader at the John Innes Centre. She completed her PhD from Punjab Agricultural University, exploring the genetic diversity present in Ae. tauschii, the D genome progenitor of bread wheat. Fascinated by the enormous diversity present in wild wheat, she continued her research to tap into this diversity and improve the resistance of cultivated wheat to a wide range of biotic and abiotic stresses. She is working with international collaborators to build a catalog of cloned R genes which would help underpin breeding for durable resistance with the hope this effort will eventually help to reduce the use of pesticides in agriculture and mitigate health risks for people around the world.

Sabina Asghar, from Pakistan, is a research officer at the Wheat Research Institute at Faisalabad, Pakistan. She completed her M.Sc. Hons. Agriculture with specialization in Plant Breeding and Genetics at the University of Agriculture, Faisalabad. In 2013, she was honored with the highly prestigious Borlaug Fellowship Program at the University of Minnesota where she contributed to the development of high-yielding rust resistant wheat varieties and evaluated breeding material for leaf rust resistance. Her current research focus is wheat pathology and breeding for durable rust resistance and understanding the complex interactions between wheat and rusts to devise breeding strategy for managing rusts through genetics. She hopes these modern breeding tools will be useful in enhancing the resistance of Pakistani wheat.

Valentyna Klymiuk, from Ukraine, is a post-doc in the Department of Plant Sciences at the University of Saskatchewan. Her first PhD was earned from the Institute of Hydrobiology of National Academy of Sciences of Ukraine, in parallel with the University of Haifa. Her second PhD, in Plant Genomics and Host-Parasite Interactions, focused on the cloning of the stripe rust resistance gene Yr15 from wild emmer wheat, which encodes for the Wheat Tandem Kinase 1 (WTK1) protein. After cloning Yr15, she and other researchers discovered a novel plant protein family designated as "Tandem Kinase-Pseudokinases (TKPs)" that are involved in plant immunity.

Carolina Rivera, from Mexico, is Associate Scientist in Wheat Physiology at CIMMYT. She received her BSc in Biotechnology from Instituto Tecnologico de Sonora (ITSON) and earned her PhD at the University of Nottingham through the MasAgro initiative. In her role as International Wheat Yield Partnership Data Coordinator, Rivera manages the CIMMYT-IWYP Wheat Germinate database that hosts the most relevant outputs of the IWYP project and the IWYP Hub. She also leads the improvement of phenotypic data workflows in the Wheat Physiology group.

Jyoti Saini Sharma, from India, where she completed her bachelor's and master's degrees in biotechnology. Her dissertation focused on the genomic characterization of domestication-related traits and stem rust resistance in tetraploid wheat. She is currently a post-doc at the University of Minnesota with Pablo Olivera Firpo. In 2018, Sharma joined the Colin Hiebert lab at Morden Research and Development Centre, Agriculture and Agri-Food Canada (AAFC), where she worked on mapping and cloning of stem and leaf rust resistance by using the map-based cloning and MutChromSeq techniques. Sharma is an ardent supporter of interaction and communication among all the research groups and women empowerment in agricultural research.

Fikrte Yirga Belayineh, from Ethiopia, received her BS in Agriculture Plant Science in July 2013, graduating with distinction. She engaged in various wheat pathology research activities until joining the Postgraduate Programs Directorate at Haramaya University in October 2016 to pursue her MSc study in Plant Pathology in the School of Plant Sciences. Belayineh's MSc thesis work, under the supervision of Ayele Badebo focused on characterization of Puccinia striiformis f. sp tritici and evaluation of wheat genotypes for their resistance to stripe rust. After earning her masters, she continued her research work on wheat diseases joining the Wheat Regional Center of Excellence at Kulumsa Agricultural Research Center in Ethiopia. Born and raised in a farming family in rural Ethiopia, Belayineh developed an early curiosity and passion for field crops such as wheat on her father's field, and saw how her family and many other farming families struggled.

2020 AWARDEES

Anna Elizabeth Backhaus, from Germany is a PhD student at the John Innes Centre, where she is supervised by Cristobal Uauy and Richard Morris, Backhaus focuses on the genetic network in control of early spike development and trying to understand how developmental decisions are encoded in the wheat genome. As part of her work, she is performing RNA-sequencing on sections of the young wheat spike using single cell technologies and using this approach to identify genetic networks in control of spikelet number and grain number, two interlinked traits that control final plant yield. Backhaus studied plant sciences at the University of East Anglia (Bsc) and University Bonn (Msc). She has also worked at the Max Planck Institute in Cologne and ICARDA.

Bharati Pandey, from India, is a Computational Biologist in the Bioscience Group, Bhabha Atomic Research Centre (BARC), Mumbai, Maharashtra, India. In 2015 she completed her doctoral degree from Birla Institute of Technology. In her doctoral thesis she worked on identifying and validating single nucleotide polymorphism (SNP) markers in abiotic stress-responsive genes and identifying stress-induced microRNAs in wheat. As a Research Fellow at the ICAR-Indian Institute of Wheat and Barley Research Institute (IIWBR), she contributed to wheat genomics research by identifying and analyzing simple sequence repeat dynamics in three different rust fungi: stem, leaf and stripe rust. Bharati and her team have designed and developed an Indian wheat database which allow users to retrieve information about molecular markers linked to rust resistance genes.

Yewubdar Ishetu Shewaye, from Ethiopia, works as a wheat breeder for the Ethiopian Institute of Agricultural Research (EIAR), at the Debre Zeit Agricultural Research Center. She completed her BS in plant science in 2010 at Madawalabu University, Ethiopia, and her MS at Hawassa University, where she focused on the identification and characterization of stripe rust resistance genes in wheat using conventional and molecular marker approaches. Shewaye is deeply interested in research areas such as screening and characterizing wheat genotypes for rusts, association mapping for rust resistance, identifying diagnostic markers, understanding the mechanisms of host-pathogen interactions, selecting the best parent combinations for crosses to pyramid resistance genes, and mining wheat germplasm to discover more durable rust resistance genes that will be beneficial to the whole wheat breeding community.

Paula Silva, from Uruguay, is an Associate Researcher at INIA Uruguay. She received her PhD from Kansas State University and her BS at the School of Science of Universidad de la Républica, and her MS from the School of Agronomy, in Uruguay. Her MS advisor, Dr. Silvia Germán, instilled in her a true passion for wheat breeding for disease resistance. She works on breeding for barley yellow dwarf and blast resistance by characterizing wild relatives of wheat to search for novel sources of resistance. In 2019, she was appointed at INIA to lead part of the disease resistance breeding program as well as coordinate the Precision Wheat Phenotypic Platform for Wheat Diseases in collaboration with CIMMYT.

Peipei Zhang, from China, is a researcher at Hebei Agricultural University, where she completed her PhD in Plant Pathology. For the last decade, Zhang's research has focused on wheat rust genetics, specifically on gene discovery and QTL mapping resistance to both leaf rust and stripe rust using bi-parental mapping populations, identification of leaf rust resistance genes in wheat cultivars using genome-wide association mapping, and map-based gene cloning for leaf rust resistance gene. She has identified potentially new genes and the closely linked markers of these genes which can be used in marker assisted selection and wheat breeding. Zhang hopes her research will benefit millions of smallholder farmers in China and other countries to reduce wheat loss due to rust diseases.

2021 AWARDEES

Elina Adhikari, from Nepal, is a plant geneticist at the University of Wisconsin-Madison. Her research aims to conduct genetic mapping and develop methods for optimizing genetic gain through plant breeding. She earned her undergraduate degree in 2012 from Tribhuvan University in Nepal, an MS from North Dakota State University, and a Ph.D. in Genetics from Kansas State University. Adhikari's preliminary field trials demonstrated that some of the inter-specific lines with wild relative introgression outperformed the best checks suggesting that genetic diversity in wild relatives could be utilized for breeding climate-resilient wheat varieties.

Reem Joukhadar, from Syria, is a research scientist at AgriBio, Agriculture Victoria, Australia. Joukhadar's current research focus is developing wheat cultivars with high grain yield, nutritional value, and ability to withstand future climate challenges using advanced molecular and computational tools. Joukhadar started her professional career at the International Centre of Agricultural Research in the Dry Areas (ICARDA) after obtaining her B.Sc. from the University of Aleppo, Syria. In 2019, Joukhadar obtained her PhD in molecular genetics at La Trobe University and the molecular genetics group at AgriBio, where she used genomics to study the evolutionary history of Australian wheat. Connecting evolution with breeding to answer evolutionary questions that can have practical impact in real life is one of the most attractive research areas for Joukhadar.

Mehnaz, from Pakistan, is a PhD student at the University of Sydney. Mehnaz completed BSc (Honours) and MPhil in Plant Breeding and Molecular Sciences form Agricultural University Peshawar, Pakistan. After completing her studies, she was appointed as a Research Scientist at Agricultural Research Station under Government of KPK (Pakistan) Agriculture Livestock and Cooperative Department. She discovered, characterized and fine mapped a novel gene conferring resistance to barley leaf rust which was officially designated as Rph28 and the findings were published in an international peer reviewed journal. She has also fine mapped and developed a closely linked marker for gene Rph14.

Ella Taagen, from the United States, is a PhD candidate studying with Mark Sorrells' Small Grains Breeding and Genetics lab at Cornell University. As a quantitative geneticist, Taagen explores relationships between recombination variation and desirable phenotypes. Using wheat as a model, her dissertation research is focused on the biological constraints of meiotic recombination in a plant breeding context, and the potential to modify recombination to enhance genetic gain. Taagen also contributes to the scientific community by advocating for equity and inclusion in STEM with student leadership roles that amplify the voices of diverse scholars. She has served as chair of online communications for Cornell Graduate Women in Science, as well as the president of Synapsis, the Cornell Plant Breeding graduate student association.

Batiseba Tembo, from Zambia, is a plant breeder in the Ministry of Agriculture under the department of Zambia Agricultural Research Institute (ZARI). Tembo obtained her BSc. and MSc. at the University of Zambia. She obtained her Ph.D. in plant breeding at the University of KwaZulu-Natal, Pietermaritzburg campus, South Africa. As a breeder, she is keen to increase wheat yields under rain-fed condition, which is faced with huge challenges such as wheat blast, spot blotch leaf rust and head blight, by developing varieties that are high yielding, disease resistant and tolerant to abiotic stresses while taking into consideration farmers' preferred traits. Her passion for wheat research led to her discovery of wheat blast in Zambia, the first-time blast was observed in the continent of Africa.

2022 AWARDEES

Samira El Hanafi, from Morocco, is a postdoctoral research fellow at Leibniz Institute of Plant Genetics and Crop Plant Research (IPK) in Germany. She focuses on the development and implementation of genome-wide predictions and association mapping for plant genetic resources, defining trait-customized core collections to maximize the diversity present within IPK genebank accessions, and researching rare alleles by applying genomic tools. She received her Ph.D. from Mohammed V University in Morocco, with research activities funded by the International Center for Agricultural Research in the Dry Areas (ICARDA). El Hanafi earned her B.Sc. and M.Sc.degrees from Sidi Mohamed Ben Abdellah University in Morocco.

Rizky Kirana, from Indonesia, is an academic staff member at Gadjah Mada University in Indonesia and is pursuing a Ph.D. at the University of Natural Resources and Life Sciences, BOKU Vienna-Austria. She received a B.Sc. in agronomy from Sebelas Maret University, Indonesia, and an M.Sc. in plant breeding from Gadjah Mada University. Her current research focuses on the characterization of fusarium head blight resistance in durum wheat. She collaborates with the John Innes Center to evaluate potential fusarium head blight resistance in wild wheat relatives.

Shitaye Megerssa, from Ethiopia, is a researcher in the durum wheat breeding program at the Ethiopian Institute of Agricultural Research. She earned a Ph.D. in plant breeding and genetics from Cornell University in 2021. She received her B.Sc. in plant science at Alemaya University in Ethiopia and her M.Sc. in plant science from Wageningen University.

Charlotte Rambla, from Italy, is a Ph.D. candidate in the Lee Hickey Lab at the Queensland Alliance for Agriculture and Food Innovation. She completed her B.Sc. and M.Sc. degrees at the University of Padova. She studies the root system of wheat to aid in the development of elite wheat varieties by integrating a range of tools, including a novel single plant selection method for root traits, marker-assisted selection for key root genes, and rapid backcrossing using speed breeding.

Umara Sahar Rana, from Pakistan, is an assistant professor at the University of Agriculture at Faisalabad where she earned her B.Sc. and M.Sc. degrees in plant breeding and genetics. She received her Ph.D. in agronomy from Kansas State University. Under the supervision of Guihua Bai, Rana's research identified genes resistant to fusarium head blight in U.S. winter wheat. She also developed and characterized wheat germplasm for durable rust resistance and reduced fungicide use.

Jianping Zhang, from China, is a postdoctoral research fellow with Peter Dodds at the Commonwealth Scientific and Industrial Research Organization (CSIRO). Her Ph.D. degree resulted from a joint program between the CSIRO rust group and the Plant Breeding Institute (PBI) of The University of Sydney. As a recipient of the Monsanto (now Bayer)'s Beachell-Borlaug International Scholars Program Award, her research interests focus on the wheat rust disease pathogen, including host resistance characterization and isolation, host immune receptor function, disease resistance breeding and molecular assist breeding, germplasm resistance screening, and pathogenicity evolutionary pathways.

Jeanie Borlaug Laube Women in Triticum Award

Jeanie Borlaug Laube Women in Triticum
Mentor Award

Lesley Boyd (2011), from the U.K., is a research group leader at the National Institute of Agricultural Botany, in Cambridge, UK. A wheat-rust pathologist for over 20 years, she has worked to improve our understanding of the complex genetics and functional mechanisms that explain the complex interactions between cereals and pathogens. Boyd has many international collaborators, and supports colleagues in their research around the world. "The desire to make a difference in this world should be the driving force behind every scientist," she says.

Francis Chuks Ogbonnaya (2012), an Australian citizen originally from Nigeria, supervisor of two WIT winners, joined the Grain Research and Development Corporation in Canberra, Australia, in 2012, and remains there in his current role as manager of oilseeds and pulses. Francis used his WIT Mentor Award to create a fund to provide on-going scholarships for orphaned undergraduates to complete their studies. The scholarship continues to this day. This year he is supporting two women who are pursuing their secondary education.

Yue Jin (2013), from the U.S., an expert in biology and population genetics of cereal rust fungi, has worked extensively to promote gender parity in agriculture by actively training women and men in regions where tremendous barriers to gender equity exist. Yue Jin served as a mentor to 2010 WIT award winner, Maricelis Acevedo, and hired Maria Newcombe, a 2012 WIT award winner, to join the USDA-Cereal Disease Lab (CDL) in Minnesota. Early in the Ug99 crisis, he brought Dr. Ruth Wanyera from the Kenya Agricultural Research Institute (KARI) to the CDL to learn race identification and handling techniques.

Arun Joshi (2014), of Nepal, is regional director, CIMMYT, based in India. Colleague Sarala Sharma said, "Joshi fully understands the significance of the feminization of agriculture in South Asia and has showed very positive attitude in supporting women farmers, scientists and students." As professor of Genetics and Plant Breeding at Banaras Hindu University, Joshi mentored 2014 WIT winner Chhavi Tiwari and many other students and colleagues working in Triticum. Many of Joshi's 36 former Master's and PhD students —12 of whom are women — occupy important positions in national and international agriculture networks.

Michael "Mike" Pumphrey (2015), U.S., is the O.A. Vogel Endowed Chair of Spring Wheat Breeding and Genetics. As an associate professor at Washington State University (WSU), Mike embraces the BGRI mission to improve rural livelihoods through sustainable and secure global wheat production, and promotes gender parity and equity among all students pursuing careers in agriculture. Mike has been the mentor and major advisor or post-doctoral advisor to four WIT Early Career Award winners —Esraa Alwan (2010), Yukiko Narouka (2012), Kaori Ando (2013), and Weizhen Liu (2017) — as well as many other past and present female undergraduate students, graduate students, visiting scientists and colleagues. Mike received his BS from Oklahoma State, his MS from the University of Minnesota, and his PhD from Kansas State.

Ronald M. DePauw (2016), a native of Canada, is a retired wheat breeder from Agriculture and Agri-Food Canada. For the past 14 years, 40 to 55 percent of all of the wheat grown in Canada derived from cultivars that he and his team developed. He was elected to the Order of Canada in 2003. Ron has served as mentor to many female researchers, including three WIT Early Career Awardees, Arti Singh (2013), Samia Berraies (2013), and Silvia Barcellos Rosa (2011). Dr. Berraies said, "His progressive and encouraging attitude greatly influenced the trajectory of my research and reminded me of the true reason behind it."

Silvia Germán (2017), from Uruguay, retired at the end of 2017 from her position as a principal researcher at the National Agricultural Research Institute (INIA) of Uruguay, where she worked as a wheat and barley breeder since 1979. She continues to collaborate with her research team at INIA and supervises two students working on different aspects of wheat disease resistance. She hopes to be able to continue to mentor and transfer her experience to other students and researchers in the fields of plant pathology and genetics and breeding.

Urmil Bansal (2018), from India, leads the development and validation of molecular markers linked with rust resistance genes in wheat as Molecular Geneticist at the University of Sydney Plant Breeding Institute (PBI), Cobbitty. She completed her PhD in Genetics from the Punjab Agricultural University (PAU), Ludhiana, India. Urmil worked as associate professor of genetics in India before joining PBI in a GRDC Australian-funded Australian Winter Cereal Molecular Marker Program. She worked extensively on the discovery and mapping of new rust resistance genes in wheat, which are being used by wheat breeders worldwide. Urmil has mentored 29 MSc and PhD students of which 16 were women, including 2014 WIT Early Career Award winner, Dr. Naeela Qureshi, and is currently supervising five PhD students. Urmil's efforts to train the next generation of wheat researchers in enabling technologies to achieve food security through combating rust diseases is highly valued by the Australian and global wheat communities.

Ruth Dill-Macky (2019), from the United States, has served on the faculty of the Department of Plant Pathology at the University of Minnesota for over 26 years. Her research program, focused on the diseases of cereal crops, is internationally recognized for work on Fusarium head blight (FHB or scab). Dill-Macky has conducted research on net blotch of barley, loose smut of oat, and the root rots of cereals, while maintaining an interest in the rusts she studied as a PhD student. Her interests in plant pathology are in the management of plant diseases through the deployment of host resistance, cultural control practices, and plant disease epidemiology.

Dill-Macky, has advised seven graduate students through to the completion of their degrees and served on the graduate committees of over 60 other graduate students and post-doctoral scientists. The students she has advised or mentored have gone on to establish productive careers in industry or academia that utilize their training in the plant sciences

Evans Lagudah (2020), from Australia is Chief Research Scientist at CSIRO, Australia, a Fellow of the Australian Academy of Science and an adjunct professor at the University of Sydney. Lagudah's research interests cover basic studies on the molecular basis of multi-pathogen resistance genes, cloning of cereal immune receptors and genomic analyses/manipulation of targeted disease resistance traits. Among his research highlights are defining the molecular basis of adult plant rust resistance genes which represent novel classes of plant defense genes that function broadly in cereal crops against multiple pathogens. Lagudah continues to train and mentor PhD students, postdoctoral researchers and early- and mid-career scientists. He is a regular contributor to the West African Centre for Crop Improvement which trains the next generation of plant breeders in sub-Saharan Africa.
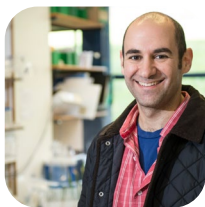
Cristóbal Uauy (2021), from the United Kingdom, is a group leader in wheat genetics and genomics at the John Innes Centre where his program focuses improving both yield and quality components in wheat. He is passionate about training the next generation of crop scientists on both scientific and soft skills. He and his scientific partners have trained more than 100 participants from 27 countries in a series of scientific skills workshops in Kenya, India, Morocco, Egypt and the UK. His lab works closely with partners in India, Ethiopia, Kenya, Brazil, Chile and CIMMYT among others. He has demonstrated a commitment to mentorship and the impact their science can have in society and farmer's fields and the WIT Mentor Award reaffirms his obligation to work towards this goal and to maintain the sense of urgency and continuous commitment.

Parveen Chhuneja (2022), from India, is the Director and Principal molecular geneticist at the School of Agricultural Biotechnology at Punjab Agricultural University. In 2018 she and team members from the Indian Council of Agricultural Research (ICAR) earned the BGRI Gene Stewardship Award. She is a fellow of two national science academies of India. Her research focuses on identification and introgression of novel genetic variation from wild wheat species into cultivated wheat leading to wheat gene pool enrichment. Along with her team, she has successfully introgressed a series of genes for disease resistance, quality, and productivity traits from wild Aegilops and Triticum species to elite wheat backgrounds. Chhuneja has mentored more than 30 young women researchers, including WIT Early Career awardees Mitaly Bansal (2016) and Sanu Arora (2019).

Today's women scientists are building a wheat-secure future.

Jeanie Borlaug Laube Women in Triticum
Mentor Award

The Jeanie Borlaug Laube Women in Triticum Mentor Award, established by the BGRI in 2010 and first awarded in 2011, recognizes men and women who have proven to be excellent mentors of women working in Triticum and its nearest relatives.

Recipients receive a cash honorarium of 3,000 USD.

The Jeanie Borlaug Laube Women in Triticum Mentor Award:

- Is made annually to nominees who have demonstrated excellence in mentoring women working in Triticum or its relatives, and who are committed to increasing gender parity in agriculture.

- Is based on a nominee's demonstrated commitment to scientific outputs that contribute to healthy families around the world.

- Is based on nomination letters.

Jeanie Borlaug Laube Women in Triticum
Early Career Award

The Jeanie Borlaug Laube Women in Triticum Award provides professional development opportunities for women working in wheat during the early stages of their careers. Established in 2010 by the Borlaug Global Rust Initiative (BGRI), the award is named after Jeanie Borlaug Laube, mentor to many, and daughter of Nobel Laureate Dr. Norman E. Borlaug.

The Jeanie Borlaug Laube Women in Triticum (WIT) award:

- Is made annually to women of any age who have demonstrated leadership potential and a commitment to and passion for agricultural development in Triticum or its relatives.

- Is intended for early career scientists ranging from advanced undergraduates to recent PhD graduates and post-doctoral fellows, with preference given to women at the pre-professoriate level.

- Is based on the strength of an applicant's scientific abstract submitted to the annual BGRI technical workshop, a personal essay, and letters of recommendation from a supervisor, professor, or mentor that speaks to the applicant's leadership potential.

Recipients of the Jeanie Borlaug Laube WIT award receive support to attend the annual BGRI Technical Workshop, and are eligible to attend a training program at CIMMYT in Obregón, Mexico.

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