DUPONT PIONEER SYMPOSIA SERIES

NEBRASKA PLANT BREEDING SYMPOSIUM

March 13, 2018 | Lincoln Marriott Cornhusker Hotel

Plant Breeding for Climate Resilient Agriculture

symposium is a conference for researchers to present and discuss their work. Together with academic or scientific journals, conferences provide an important channel for exchange of information between researchers.

PROGRAM

8:25 am	**Introduction** Roger Elmore, Ph.D., *University of Nebraska-Lincoln*
8:35 am	**Opening Remarks** Tabare Adabie, Ph.D., *DuPont Pioneer*
8:55 am	**New Breeding Technologies and their Implication in Commercial Hybrid Development** Laura Mayor, Ph.D., *DuPont Pioneer*
9:35 am	**Environmental, Pheontypic (Imagery) and Genomic Data for Prediction of Crop Performance Trials in Complex Tratis** Diego Jarquin, Ph.D., University of Nebraska-Lincoln
10:15 am	**Break**
10:35 am	**Breeding of Quality Protein Popcorn** Ying Ren, University of Nebraska-Lincoln
10:55 am	**Genomic Selection for Fiber Quality Traits in the USDA obsolete Cultivar Collection** Mitchell Schumann, Texas A&M University
11:15 am	**DELLAcate Balance for Plant Growth by Sugar Modification** Tai-Ping Sun, Ph.D., Duke University
11:55 am	**Lunch**

PROGRAM

12:55 pm	**Distinct Genetic Architectures for Phenotype Means and Plasticities of Zea Maize** Aaron Kusmec, Iowa State University
1:15 pm	**Development and Characterization of Novel Reduced Height Alleles in Wheat** Emma Jobson, Montana State University
1:35 pm	**The Role of Time in Physiological and Transcriptomic Response to Abiotic Stress** Kaite Greenham, Ph.D., Dartmouth College
2:15 pm	**Break**
2:35 pm	**Insights into the genotype-by-environment interaction enabled through phenomics** Candice Hirsch, Ph.D., University of Minnesota
3:10 pm	**Plant Breeding in the 21st Century: Molecular Breeding & High Throughput Phenotyping** Mark Sorrells, Ph.D., Cornell University
4:00 pm	**Poster Session and Networking Social** Awards, 5:30 pm
5:30 pm	**Poster Awards**

HONARY SPEAKERS

Laura Mayor, Ph.D.

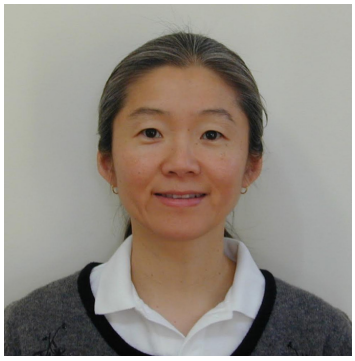
DuPont Pioneer

Mayor completed her bachelor's degree in agronomy and master of science in genetics at the University of Rosario in Argentina. She earned her doctorate at Iowa State University in plant breeding working on the genetic bases of prolificacy in maize. She started at DuPont Pioneer as a Molecular Breeding Scientist in corn for the southeast United States and moved into sorghum breeding in 2011. Since then, she established a molecular breeding strategy for this crop and took over responsibilities for the sorghum breeding program established in Manhattan, Kansas. Over the last couple of years, her responsibilities were extended to develop breeding strategy and planning for eastern Kansas and the High Plains markets covering the Manhattan, Kansas and Plainview, Texas research stations. The major focus of the evaluation zone are improved yield, stalk strength, sugarcane aphid tolerance and cold tolerance using new phenotyping and molecular technologies available.

Diego Jarquin, Ph.D.

University of Nebraska-Lincoln

Diego Jarquin earned his doctoral degree in statistics from Colegio de Postgraduados and post-doctoral training from University of Alabama–Birmingham and Nebraska. Jarquin's research interests are centered around statistical learning methods for predicting complex traits especially problems that allow the inclusion of high dimensional genomic and environmental information and their first order interactions. One of his main areas of expertise is the study of the genotype × environment interaction in prediction problems. He has been involved in the development of prediction models and their applications for the analysis of several crops (soybean, wheat, cotton, maize, linseed, sugar cane, and chickpea) and human data as well. Currently, he collaborates with the Genomes to Fields Consortium (G2F) by performing statistical analyses for the G×E trials. This initiative evaluates around 1,400 maize hybrids each year at 24-30 locations across the United States and two locations in Canada and records environmental information every 15 minutes at each location. His work consists of taking advantage of the high-dimensional nature of the information by incorporating different sources (besides genomics) to enhance predictive ability under a broad set of environmental conditions and help breeders in the selection process. Part of his research focuses on optimization of training-testing relationships for Genomic Selection (GS) and the design of pipelines to cope with high dimensional data sets through supercomputing resources using multi-parallel arrays. Some of his developments have been adopted by CIMMYT in their routine analyses of multi-environment trials established for breeding purposes.



Tai-Ping Sun, Ph.D.

Duke University

Sun is a professor of Biology at Duke University in Durham, North Carolina. She received her doctorate in biochemistry and genetics from Duke University, and was a post-doctoral scholar at the University of Oxford in Oxford, United Kingdom and Harvard University in Cambridge, Massachusetts. She is a reviewing editor of The Plant Cell and a contributing faculty member in FACULTY OF 1000 BIOLOGY. Sun received the Distinguished Research Award (Silver Medal) from the International Plant Growth Substances Association in 2010. Thomson Reuters also ranked her among the top 1 percent most cited researchers in Plant/Animal Biology in 2014-2016. Sun's research focuses on elucidating the sites and regulatory mechanisms of plant hormone gibberellin (GA) biosynthesis as well as the conserved molecular events of GA perception and its signaling pathway. Her research identified DELLA proteins, which are master growth repressors whose stability is controlled by GA and its nuclear receptor. DELLAs have emerged as central regulators that integrate internal and external signals via direct protein-protein interactions with key transcription factors (TFs). Her lab recently found that these crucial DELLA-TF interactions are oppositely regulated by two novel sugar modifications, revealing a new paradigm in linking metabolic status to gene expression and cell growth.

HONARY SPEAKERS

Katie Greenham, Ph.D.

Darthmouth College

Greenham is a molecular biologist whose research interests are to explore the consequences of internal timekeeping on plant fitness. She uses circadian guided network approaches to combine temporal studies of abiotic stress response to identify the time of day dependent markers of stress tolerance. As an NSF National Plant Genomes Initiative Postdoctoral Fellow, she applied co-expression network analysis to integrate temporal changes in transcriptomic and physiological responses to drought in the crop Brassica rapa. This study revealed early indicators of drought perception and the importance of time when assessing drought response. Greenham received her bachelor's degree at Queen's University in Kingston, Ontario. She completed her doctorate with Mark Estelle, Division of Biological Sciences distinguished professor and chair at University of California San Diego, where she focused on the role of auxin signaling during seedling development. Greenham is currently a post-doctoral researcher in the lab of Rob McClung, professor of biological sciences at Dartmouth College She can be found early most mornings at the local CrossFit gym or out on her bike.

Candice Hirsch, Ph.D.

University of Minnesota

Hirsch received her doctorate in plant breeding and plant genetics from the University of Wisconsin-Madison and conducted postdoctoral research at Michigan State University. Her research involves the integration of big data including high throughput genome and transcriptome sequencing, high throughput phenotyping, and extensive environmental measurements with the end goal of produce more food on less land while mitigating risk to farmers associated with environmental conditions.

Mark Sorrells, Ph.D.

Cornell University

Sorrells specializes in plant breeding methodologies and strategies and develops new varieties of wheat, oats, and barley. Current research topics include genomic selection, high throughput phenotyping and organic grains breeding. He earned his bachelor's in botany in 1973 and Master of Science in plant and soil science in 1975 at Southern Illinois University, Carbondale. He earned his doctorate in plant breeding and plant genetics in 1977 at the University of Wisconsin, Madison. He joined the Department of Plant Breeding and Biometry in 1978 and has been a full professor of plant breeding since 1991. Sorrells was Chair of the Department of Plant Breeding and Genetics from 2006 to 2014. Sorrells has authored or co-authored more than 270 peer-reviewed publications. He is a Fellow of the Crop Science Society of America and the American Association for the Advancement of Science. Awards include the Crop Science Society of America Outstanding Research Award, SUNY Chancellor's Award for Excellence in Faculty Service, and the Cornell College of Agriculture Outstanding Accomplishments in Applied Research.

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Dermot P. Coyne, George Holmes Professor, Department of Horticulture, UNL. Dermot was born in Ireland and came to the United States in 1954 to attend Cornell University where he received his PhD in Plant Breeding. He came to the University of Nebraska in 1960 and his 40 year career included research and teaching, with his research concentrating on dry beans and squash. His breeding program incorporated disease resistance from germ plasm of land race varieties and lines from many countries. His commitment to world hunger and breeding a food line that was helpful for the poor and malnourished was always at the forefront of his research. Dermot was committed to teaching and was actively involved with education of graduate students from around the world. During his tenure at UNL he advised over 40 graduate students and doctoral candidates, helping many of them to return to their home countries to improve their own food crops and agriculture.

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