

TEXAS A&M PLANT BREEDING BULLETIN

February 2014

Our Mission: Educate and develop Plant Breeders worldwide

Our Vision: Alleviate hunger and poverty through genetic improvement of plants

Today I want to feature Andrea Maeda, one of our outstanding plant breeding graduate students from Brazil. Not only is Andrea an outstanding student, she also is assisting LeAnn Hague, our Distance Education Coordinator, with preparation and formatting our courses for distance delivery.

Andrea Maeda is a native of Brazil and joined our plant breeding graduate student program in 2012. She came to College Station in 2010 when her husband was accepted into the Department's cotton physiology M.S. program under the direction of Dr. Carlos Fernandez at the Corpus Christi Research and Extension Center. Andrea looked at a number of our plant breeding programs before beginning an M.S. program with Dr. David Stelly in cotton genetics and breeding.

Andrea received her bachelor's degree in Biology at the Federal University of Uberlandia in Brazil in 2008. While an undergraduate student Andrea worked in the University's soybean breeding program and upon graduation she accepted a position as Research Assistant in the cotton breeding program of DeltaPine/Monsanto in Brazil. Andrea noted that "I grew as a plant breeder during those three years and the experience instilled in me the desire for additional education in plant breeding and preparing for a career as a professional, Ph.D. level plant breeder." Those doors began to open when her husband, Murilo, applied and was accepted for graduate studies at Texas A&M and Soil &



Crop Sciences. Andrea improved her English through classes in the English Language Institute during her first year at College Station and applied for graduate studies in plant breeding in the Department and was accepted by Dr. David Stelly. Andrea noted “it has been a good life experience so far. The multicultural environment that surrounds TAMU is something that you cannot find easily around the world and this coexistence of different individuals with different realities is so important to open your mind and to make you realize that the world has so much more to offer than what you have at home. I plan to go back to my country taking all the knowledge and experiences that I got from here, hoping to be one more of the bridges that connect Brazil and the US. After acquiring my Master’s degree in Plant Breeding and hopefully a PhD degree in Plant Breeding or Genetics, I will be able to meet the criteria for a position in a company that is more focused in the genetics and molecular side of plant breeding as it is where my interests are.”

Andrea’s M.S. research concerns a mutant of cotton, “Semigamy,” that affects reproduction in manners of interest to biologists, geneticists, and plant breeders. Below is an abstract describing her project.

An analysis of *Semigamy* (*Se*) expression

Andrea Maeda and David Stelly

Semigamy, *Se*, is an abnormal type of reproduction rarely reported among natural apomictic species. In Pima cotton (*Gossypium barbadense* L.), a natural mutant gene was found to cause an altered form of *Semigamy*. Our lab has worked with this mutant at the reproductive, cytological, genetic and molecular levels, as it is of both basic biological interest, and as a prospective tool for genetic manipulations in research and applied breeding. The mutant plants produce high frequencies of maternal, paternal, and chimeric haploid progeny and even trichimeric plants with normal (non-haploid) sectors. Upon chromosome-doubling, the haploids yield true-breeding homozygotes that can allow the researcher and breeder to expedite the inbreeding process. Further knowledge about the gene’s mode of action and expression could be valuable for breeding programs, since the gene potentially can be used for mass production of doubled haploids. The goals of my work are to confirm previous studies about *Se* expression in female parents, unequivocally confirm mapping position of the gene, and investigate *Se* expression in male parents. I have

created testcross and backcross populations, extracted DNA samples, used bioinformatics resources, and in-house Next Generation Sequencing results to identify single-nucleotide polymorphisms (SNPs) in DNA of parents. We then designed and ordered the SNP primers for simplex assays using the KASPAR assay, and I determined which assays work well and involve SNPs where I want them. The best SNPs were used as markers to analyze seed and plant populations. Most results are complete or nearly complete and will be prepared for publication soon, and incorporated into my MS thesis.

Continuing Education in Plant Breeding at Texas A&M University

Continuing education course modules in plant breeding and genetics, and related disciplines are available from Texas A&M University to clientele interested in gaining new information in plant breeding or simply seeking refresher courses. This program is designed for individuals employed in private industry, CGIAR centers, government agencies, non-government organizations, and other agriculture professionals who need and desire additional knowledge and training in plant breeding but who are not interested in an additional academic degree. A professional certificate can be a part of this program. No campus visit is required. Course modules currently open for enrollment are

[\(https://scsdistance.tamu.edu/purchase/\)](https://scsdistance.tamu.edu/purchase/):

Basic Plant Breeding: W. Smith

Unit 1: Introduction to Plant Breeding (13 January)

Unit 2: Self Pollinated Crops (24 February)

Unit 3: Cross Pollinated Crops (28 March)

Quantitative Genetics and Plant Breeding: S. Murray

Unit 1: (13 January)

Unit 2: (24 February)

Unit 3: (28 March)

Analysis of Complex Genomes: H. Zhang

Unit 1: DNA Marker Technology and Mapping (13 January)

Unit 2: Recombinant DNA and Cloning (24 February)

Unit 3: Sequencing Genomes and other Genomic Tools (28 March)

Host Plant Resistance: W. Smith

Unit 1: Introduction to HPR (13 January)

Unit 2: HPR to Diseases (24 February)

Intellectual Property and Plant Breeding: R. Jessup

Unit 1: Intro to IP, International Treaties & Patents (13 January)

Unit 2: IP Documentation (24 February)

Unit 3: IP Transfer and Enforcement (28 March)

Other Continuing Education courses in plant breeding and related disciplines that will be available include Host Plant Resistance; Selection Theory; Marker Assisted Selection; Genomic Analysis; Field Crop Diseases; Field Insects; Essential Nutrients in Crop Growth; and others. For more information visit <https://scsdistance.tamu.edu/> or contact LeAnn Hague, Distance Education Coordinator in Soil and Crop Sciences at leann.hague@tamu.edu or (979)845-6148.

Distance Plant Breeding MS and PhD degree programs at Texas A&M. Visit <https://scsdistance.tamu.edu/plant-breeding-distance-education/> for details.

National Association of Plant Breeders 2014 Annual Meeting in Minneapolis MN on August 5 – 8. Visit www.plantbreeding.org for details.

Please direct comments concerning this bulletin to Wayne Smith, cwsmith@tamu.edu or 979.845.3450.