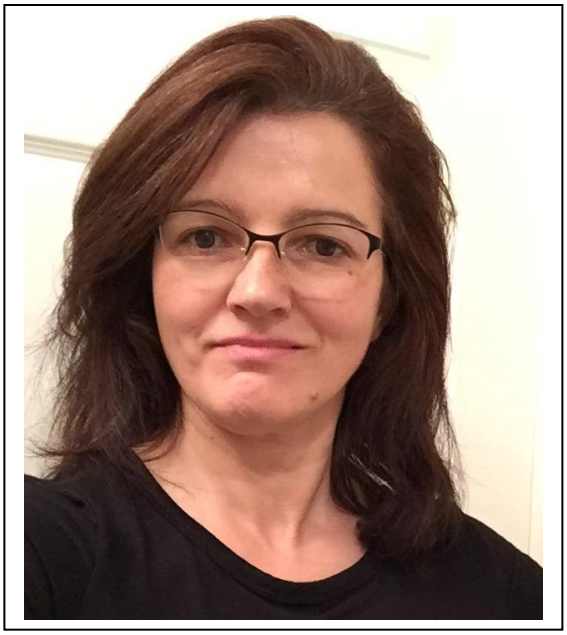
TEXAS A&M PLANT BREEDING BULLETIN

January 2017

TEXAS A&M UNIVERSITY--EDUCATING AND DEVELOPING PLANT BREEDERS WORLDWIDE TO ALLEVIATE HUNGER AND POVERTY THROUGH GENETIC IMPROVEMENT OF PLANTS



WE WANT TO WELCOME OUR NEWEST TAMU PLANT BREEDING FACULTY MEMBER TO THE DEPARTMENT OF HORTICULTURAL SCIENCES AT TEXAS A&M UNIVERSITY. DR. ISABEL VALES ASSUMED THE POSITION OF ASSOCIATE PROFESSOR-POTATO BREEDER ON 1 JANUARY 2017 FOLLOWING THE RETIREMENT OF DR. CREIGHTON MILLER. Dr. Vales received her undergraduate degree in Biological Sciences from the University Santiago de Compostela, Spain and her M.S. and Ph.D. from the University Vigo, Spain. ISABEL BRINGS A DIVERSE AND VAST EXPERIENCE IN PLANT BREEDING TO TEXAS A&M AND I'M PLEASED TO SHARE HER BACKGROUND AS WELL AS WELCOME HER TO OUR COMMUNITY OF PLANT IMPROVEMENT SCIENTISTS AT TEXAS A&M UNIVERSITY AND TEXAS A&M AGRILIFE RESEARCH.

DR. VALES WAS AN INTERNATIONAL SCIENTIFIC CONSULTANT FROM 2012 THROUGH 2016 WHERE SHE PROVIDED editorial support, data analysis, offered advice, guidance, innovative solutions, and links to several research groups involved in international agricultural research and development. She also coordinated the introduction and testing of early-maturing pigeonpea lines (less photoperiod sensitive lines that

she developed at ICRISAT) and heat/drought tolerant chickpea lines in Spain and the USA with collaboration from the Spanish National Research Council (CSIC) and Washington State University (WSU). During this time Isabel continued collaborations with the Oregon State University Potato Breeding and Genetics Program where she prepared release and PVP documents, analyzed data, and provided scientific programmatic advice.

Isabel brings considerable international professional experience to her new role as she was a Principal Scientist in the pigeonpea breeding and genetics program at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in Patancheru, India from 2010 through 2012. The goal of the program was to develop high yielding and disease resistant pigeonpea lines. In this role, Dr. Vales worked on the diversification of the nuclear and cytoplasmic basis of their breeding pool. She developed over 40 medium maturity and disease resistant (Fusarium wilt and sterility mosaic disease) pigeonpea inbred lines (A, B, and R lines) for the development of new hybrids. She developed more than 15 early-maturity group that can be harvested in ~90 days, thus suitable for a wheat-legume cropping system in several parts of Northern India. In an effort to modernize the ICRISAT pigeonpea breeding program, she implemented new breeding data management software and databases to facilitate management and coordination, improve efficiencies, and to simplify decisions and selections. Isabel was heavily involved in developing genetic stocks (RILs) for constructing genetic maps of pigeonpea.

Prior to Isabel's work at ICRISAT, she was Assistant and Associate Professor at Oregon State University in Corvallis. As an Assistant Professor, she conducted genetic studies with barley, wheat and jointed goatgrass. These studies included gene flow assessments

between wheat and jointed goatgrass, marker-trait associations in barley for barley stripe rust, domestication traits in wheat, and development of introgression lines of barley. With her promotion to Associate Professor, Isabel assumed the Oregon Potato Variety Development and Foundation Programs where she implemented a conventional breeding program focused on improving yield, quality, and disease/pest resistance of mainly processing types, but special effort was also dedicated to the development of new specialty potatoes that could provide the growers and consumers with options to diversify the market and to enhance nutrition and health. At OSU, Dr. Vales trained undergraduate and graduate students and taught an undergraduate course in potato production and a graduate course dealing with molecular breeding. Dr. Vales participated in the release of 15 potato varieties.

Isabel enjoys reading, photography, and other outdoor activities with her family. Welcome Dr. Isabel Vales.

Meetings of Interest

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Phenome 2017 will be held in Tucson, AZ, February 10 – 14. See http://www.phenome2017.org/info for more information.

National Association of Plant Breeders, NAPB will

hold their annual meeting at the UC Davis Activities and Recreation Center August 7 – 10, 2017. More information will be available soon at https://www.plantbreeding.org.

Distance Plant Breeding at Texas A&M

Distance Plant Breeding at Texas A&M

Distance Plant Breeding Program and Continuing Education courses available for Spring (https://scsdistance.tamu.edu/available-courses)

Continuing Education

Spring Courses: January 17 – May 9, 2017

To fully participate in our continuing education courses, students should have:

- High speed internet connection and updated browsers, including Internet Explorer and either Chrome of Firefox
- Common plug-ins (e.g. Adobe Reader, Flash Player, Virus Protection, Java, etc.)
- Speakers and Webcam with microphone
- Skype
- Ability to either scan or fax course documents to the instructor

Spring 2017

Plant Breeding Fundamentals – Full Course (3 Units) – Cost $679.65
January 17 -May 9, 2017
Introduction to the field of plant breeding for students without a plant breeding background. Includes common plant breeding terminology and introduction of concepts. Genetic improvement of crops by hybridization and selection; special breeding methods and techniques applicable to naturally self-pollinated, cross-pollinated and asexually reproduced plants.

Basic Plant Breeding - Full Course (3 Units) - Cost - $679.65

January 17-May 9, 2017

Basic Plant Breeding can be taken as an entire course (all three units) or each unit can be taken individually. For participants in our Professional Certificate in Plant Breeding and Genetics, completion of all three units is required.

Unit 1 - Introduction to Basic Plant Breeding *Cost - $226.55*
January 17 – February 17, 2017
Introduction to Basic Plant Breeding provides a review of plant reproduction, genetic variation, gene banks, germplasm preservation, gene segregation, the power of selection and its role in plant breeding, and an introduction to intellectual property and its role in the life of a plant breeder. This unit is designed to prepare the participant to explore the genetics and methodologies employed by plant breeders of self and cross pollinated crop species in units two and three of Basic Plant Breeding.

Unit 2 - Breeding Self Pollinated Crops *Cost - $226.55*
February 20 – March 31, 2017
The frequency of any specific heterozygous locus will be reduced by 50% for every generation of selfing, resulting in a mixture of homozygous lines within any natural population. Phenotypic selection within heterozygous generations will lead to homozygous or near homozygous germplasm lines or cultivars under self-pollination. This unit is designed to communicate plant breeding methodologies that take advantage of the genetic consequences of natural or forced self-pollination in agronomic crops. Topics will include: [1] the basics of segregation, [2] breeding methodologies, [3] the grain sorghum conversion program-an example of backcrossing in a different direction, [4] review of a commercial soybean cultivar development program, and [5] a review of the types of genetic releases from Texas A&M AgriLife Research.

Unit 3 - Breeding Cross Pollinated Crops *Cost - $226.55*
April 3 – May 9, 2017
Topics covered include: quantitative genetics and plant breeding, effects of selection on Hardy Weinberg Equilibrium, mating designs with cross pollinated crops, breeding methods for cross pollinated crops, deviations from Mendelian ratios, genetic male sterility and hybrid seed production, seed certification and types of release.

Recommended textbooks are “Breeding Field Crops” by J.M. Poehlman and D.A. Sleper, and “Principles of Cultivar Development” by W.F. Fehr. A final exam will allow the participant to assess their grasp of topics covered. Participants in the Plant Breeding and Genetic Certificate Program must score 70% on the final exam for each unit.

This is a "self-paced" course and is available for viewing for a limited time. Time commitment is individual student driven. Few outside assignments are made. Students should view each lecture, review all previous lectures and be prepared to discuss any issues that are unclear. Each unit has a printable note set and most units have a set of review questions that can be used as a tool to check your comprehension and grasp of unit concepts. Feel free to contact the instructor, Dr. Wayne Smith, by e-mail (cwsmith@tamu.edu) or phone (979-845-3450) with any questions you have or if you need additional information.

Analysis of Complex Genomes – Full Course (3 Units) – Cost - $679.65
January 17-May 9, 2017

Genome structure, organization and function of model organisms and higher eukaryotes; theory and methodology of genetic and physical mapping, comparative genomics, sequencing, sequence analysis and annotation; emphasis on understanding the function of complex genomes, genome-wide expression analysis, genetic and epigenetic mechanisms; X-inactivation, imprinting, gene silencing, transposons, genome duplication and evaluation. Requires an in-depth and working knowledge of basic and advanced plant breeding concepts.

Unit 1 – DNA Marker Technology and Genetic Mapping *Cost - $226.55*
January 17 – February 17, 2017

Unit 2 – Recombinant DNA and Cloning *Cost - $226.55*
February 20 – March 31, 2017

Unit 3 – Sequencing Genomes and Other Genomic Tools *Cost - $226.55*
April 3 – May 9, 2017

Intellectual Properties in the Plant Sciences - Full Course (3 Units) - Cost - $679.65
January 17-May 9, 2017

This course introduces the major foci of intellectual property (IP) impacting plant sciences, including: 1) traditional vs. emerging knowledge economies, 2) governing U.S. statutes and international treaties, 3) forms of IP protection, and 4) IP asset identification, valuation, capture, and deployment towards an understanding of best practices for the development of effective IP strategies and management of IP portfolios.

Unit I - Introduction to Intellectual Property, International Treaties and Patents *Cost - $226.55*
January 17 – February 17, 2017
Unit I of the Intellectual Properties in the Plant Sciences Course. Topics covered include: IP Culture and the Knowledge Economy, Traditional Knowledge vs. Biopiracy, Sui generis Systems, International Treaties, Overview of Patentability, Utility Patents, and Plant Variety Patents.

Unit II - Intellectual Property Documentation *Cost - $226.55*
February 20 – March 31, 2017
Unit II of the Intellectual Properties in the Plant Sciences Course. Topics covered include: Trademarks, Copyrights, & Trade Secrets; USPTO; Inventorship, Ownership, Compensation, IP Training; Confidential Information; IP Audit; IP Value; Competitive Intelligence; Cyberspace – IP and IT Cooperation.

Unit III - Intellectual Property Transfer and Enforcement *Cost - $226.55*
April 3 – May 9, 2017
Unit III of the Intellectual Properties in the Plant Sciences Course. Topics covered include: Intellectual Property Transfer and Enforcement, IP Case Studies, IP Portfolio, IP Strategy and Leveraging IP Value.

Introduction to Host Plant Resistance (1 Unit) - Cost - $226.55
January 19 – February 19, 2016
Host plant resistance programs from the standpoint of the plant breeder.

Other Academic and Continuing Education courses in plant breeding and related disciplines that will be available during other semesters include Host Plant Resistance; Crop Production; 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 Degrees in Plant Breeding

M.S. and Ph.D. degree programs at Texas A&M.

Visit https://scsdistance.tamu.edu/plant-breeding-distance-education/ for details.

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