



TEXAS A&M PLANT BREEDING BULLETIN

December 2016

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

Texas A&M Plant Breeding Symposium 2017

A Dupont Plant Sciences Symposia Series Event

15-16 February 2017
Memorial Student Center

The Plant Breeding and affiliated graduate students in the Departments of Soil and Crop Sciences and Horticultural Sciences have announced the program for their 2017 Texas A&M Plant Breeding Symposium (PBS). This will be the third PBS produced by our graduate students and it looks like this one will build on the excellent reputation gained by the first two symposia. This year's theme is "The Vavilov Method: Utilizing Genetic Diversity" and the students have an outstanding line up of speakers and activities.

Keynote Speakers:

Susan McCouch, Barbara McClintock
Professor, Plant Breeding and Genetics
School of Integrated Plant Sciences,
Cornell University. Susan received her
PhD from Cornell in 1990 and was a



research scientist for five years with the International Rice Research Institute (IRRI) in the Philippines before returning to Cornell as a faculty member. She is well known for her pioneering studies on molecular mapping in rice and the development of genomics-based platforms to explore the extent, distribution and phenotypic consequences of genetic variation in *Oryza*. Researchers throughout the world utilize the molecular markers, genotyping platforms, analysis protocols and germplasm resources developed in her lab for genetics research and breeding applications. She has trained scores of young scientists who contribute to rice research nationally and internationally and has a prolific publication record. She is the recipient of numerous teaching and faculty awards, including the prestigious AAAS Fellow. She has served as scientific advisor on the Global Rice Science Partnership (GRiSP), the NSF Advisory Committee for International Science and Engineering (AC-ISE), and as Chair of the AAAS Section on Agriculture and Natural Resources.



Colin Khoury is a Crop Diversity Specialist at the International Center for Tropical Agriculture (CIAT), Colombia, and a researcher at the USDA National Laboratory for Genetic Resources Preservation in Fort Collins, Colorado. Colin's interest is in enhancing food security, human health, and the sustainability of agricultural production systems through the conservation and use of crop genetic resources. Most of his research energy is in the

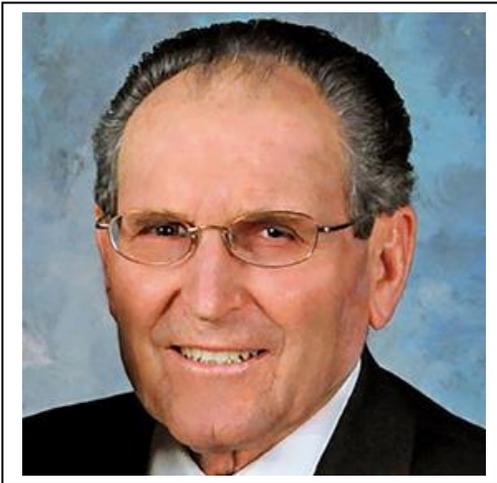
area of conserving wild relatives of our food crops and trying to understand how changes in diversity in our diets and agricultural production impact food security.

Paul Gepts, Distinguished Professor, Plant Sciences, University of California at Davis. Paul is a native of Belgium, where he obtained his “agronomic engineering” degree before working for three years at the Gene Bank of the International Center for Tropical Agriculture (CIAT) in Cali, Colombia. At CIAT, Paul led a project emphasizing the genetic resources of *Phaseolus* beans. His results demonstrated the value of using runner bean (*P. coccineus*) and year bean (*P. dumosus*) as sources of genetic diversity in common bean (*P. vulgaris*) breeding. His PhD research at the University of Wisconsin-Madison was focused on the domestication and evolution of common bean. Following a postdoc at the University of California-Riverside, Dr. Gepts joined the faculty of the University of California-Davis where he is now a Distinguished Professor, bean geneticist, and head of the bean breeding program. During his tenure at UC Davis, he has expanded his research



into the development of genetic and genomic tools for beans, including recombinant inbred populations, BAC libraries, and PhaseolusGenes, and a marker database. His research has shown 1) the existence of and gene flow in bean species, self-pollinated species, and the potential for displacement of genetic diversity in wild beans, 2) the presence of co-evolution between the bean host and some of its fungal and bacterial pathogens based on recruitment of differential resistance specificities from the same disease resistance gene cluster, 3) the role of long-distance dispersal of ancestral bean types in establishing the current distribution of wild beans, and 4) the role of farmers in traditional agriculture, including centers of domestication, in generating and maintaining crop diversity, as described in surveys of *in situ* diversity and molecular diversity of domestication genes.

Charles Simpson, Professor Emeritus Texas A&M AgriLife Research, Peanut Genetics, Texas A&M University. Charlie has been the Project Leader of the Peanut Wild Species Program since 1967 and continues in that position although semi-retired. Dr. Simpson entered Texas A&M University in 1960, where he earned a BS in Agricultural Education in 1963, and his MS in 1966 and his PhD in 1967 in Plant Breeding and Cytogenetics at Texas A&M University. In September 1967, he was employed as Peanut Breeder at the



West Cross Timbers Experiment Station at Stephenville, Texas, which was later designated as a Research and Extension Center of the Texas A&M AgriLife Research. During his illustrious career, Dr. Simpson developed or co-developed and released 20 peanut cultivars but his primary interest was in germplasm preservation and utilization. He and colleagues released the first peanut cultivars with genes introgressed from wild

Arachis. The most significant of these was the transfer of resistance to root-knot nematode into cultivated peanut. He has been leader or co-leader and participant on 28 expeditions to collect cultivated and wild *Arachis* germplasm in South America. The teams have collected more than 1800 accessions of wild peanut, including more than 75 new species of *Arachis*, more than 5000 cultivated land races, and more than 500 accessions of *Rhizobia*. Charlie served on the Crop Registration subcommittee for Peanut for more than 30 years; received the Meyer Medal in 1993 for his work on collection, maintenance, distribution and utilization of *Arachis* germplasm; and in 2015 he was selected to present the Calvin Sperling Memorial Lecture on Biodiversity at the ASA CSSA SSSA annual meeting. Charlie is author or co-author of 124 refereed journal articles, 14 book chapters, and he co-translated the peanut monograph from Spanish to English. He mentored or

helped mentor 16 MS and PhD students at Texas A&M University along with numerous MS and PhD students from Argentina and Brazil.

L J. Grauke is Curator of the National Collection of Genetic Resources for Pecans and Hickories (NCGR-*Carya*).

The collection is the major germplasm repository for the genus *Carya* in the United States, and is dedicated to the collection, maintenance, evaluation, characterization and distribution of world genetic resources for that genus.

He has made collections of pecans and hickories throughout the United States as well as in Mexico, Vietnam, and China, developing and maintaining the living collections that comprise the NCGR –*Carya* clonal repository. He has worked to develop reliable molecular genetic markers to characterize the geographic distribution of genetic diversity across the genus. Dr. Grauke is Research Horticulturist for the USDA-ARS Pecan Breeding & Genetics program at College Station, TX where the major objective is the development of improved pecan cultivars and rootstocks for all U.S. production areas. He contributed to the release of several pecan cultivars currently in use by the pecan industry. In addition to the routine evaluation of selections under test, research is also conducted for the improvement of selection criteria using standard field observations and molecular genetic techniques.



Congratulations to the organizing committee for putting together a great line up of speakers and events. For more information and to register for the third annual Texas A&M Plant Breeding Symposium, go to <http://plantbreedingsymposium.com/home>. We hope that you can join us on the campus of Texas A&M University or via webinar.



The Texas A&M Plant Breeding Symposium organizing committee (L to R) Ellen Roundey (PhD candidate-Horticulture), Tessa Ries (MS candidate-Plant Pathology & Microbiology), Francisco Gomez (PhD candidate-Plant Breeding), Ammani Kyanam (MS candidate-Plant Breeding), Steve Anderson (PhD candidate-Plant Breeding), Wardha Mustahsan (MS candidate-Plant Breeding), Drutdaman Bhangu (PhD candidate-Plant Breeding), and Smit Dhakal (PhD candidate-Plant Breeding).

Meetings of Interest Meetings of Interest

The Beltwide Cotton Conferences will be held in at the

Hyatt Regency Dallas Hotel in Dallas, TX, January 4 – 6. More information can be found at <https://www.cotton.org/beltwide>.

PAG XXV, Plant and Animal Genome meetings will be January 14 – 18 in San Diego, CA. More information at <http://www.intlpag.org>.

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
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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 or 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.

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.