

2013 IPBGG Highlights



Institute of Plant Breeding,
Genetics & Genomics

This recap of events and accomplishments in 2013 is intended to inform alumni, colleagues, supporters, prospective students, and even ourselves of the Institute's broad reach and commitment to the land-grant mission of teaching, research, and service. Included are some notable highlights with an emphasis on students.



Academic Competition

Opportunities for graduate student and postdoc academic competition included the Plant Center Retreat held at Unicoi State Park and the IPBGG Retreat, held at the new Special Collections Library on the UGA Athens Campus. At the Plant Center Retreat, postdoc *Aiko Iwata* was awarded 1st place for her poster presentation on cowpea cytogenetics and *Tom Jacobs* received 2nd place in the Graduate Student division for his work on soybean genome editing. At the IPBGG Retreat, poster awards were presented to PBGG students, *Josh Clevenger*, peanut transcriptomics, *Zach King*, high-throughput DNA extraction, and *Rajiv Parvathaneni*, pearl millet dwarfing gene characterization, and postdocs/staff, *Hussein Abdel-Haleem*, soybean AI tolerance QTL and candidate genes, *Stephane Schroder*, genotyping by sequencing method, and *Ahn Pham*, soybean fatty acid genes.



IPBGG Graduate Student Association

The Graduate Student Association was formed in 2013 under the leadership of *Clinton Stekete*, *Adam Bray*, and *Ben Stewart-Brown*, and included our 7 MS and 13 PhD PBGG students. The GSA has been extremely active with organizing social, fundraising, and academic events that facilitated interaction between students and faculty within and outside of PBGG. A vegetable sale, cookout on the back deck of CAGT, and participation in the Plant and Soil Graduate Student Symposium were among these activities. *Ben Stewart-Brown* was awarded 1st Place for his presentation at the joint symposium of PBGG, CRSS, HORT, and PATH graduate students.



Retreat

A Dow AgroSciences Aid-to-Education grant, along with the Georgia Seed Development Commission and the Georgia Crop Improvement Association, helped to fund our May retreat and bring Dow scientists, David (Ike) Isenhour and Juan Rey, back to UGA. In addition to scientific presentations on maize breeding, they shared experiences and perspectives on career paths in private industry.



Social time at lunch and during an evening at Flinchum's Phoenix, located in the Forestry School's Whitehall Forest, was followed by dinner and keynote by Stephen Kresovich, who had recently been selected as Director of the Clemson Advanced Plant Technology Program. Steve captivated the audience with his account of sorghum diversity and gene discovery in this post-genomics era.



We learned the scope of and latest advances in research of faculty members Zenglu Li, soybean breeding, Donglin Zhang, woody ornamentals, and Ali Missaoui, forage crops. Zenglu Li took over the soybean breeding program after the retirement of Roger Boerma, Ali Missaoui is extending forage breeding from programs of his predecessors, Charlie Brummer and Joe Bouton, and Donglin Zhang fills the Michael A. Dirr Professorship in Horticulture. Fredy Altpeter from our neighboring institution, the University of Florida, introduced us to the potential of elephantgrass and sugarcane as biofuel feedstocks in the deep South. Two invited speakers ventured into the socioeconomic aspects of agriculture to enlighten us on the domestic roots of the Green Revolution (Tore Olsson, History Dept at UGA) and development of high impact varieties using a systems approach (Branden Lisi, Object 9).



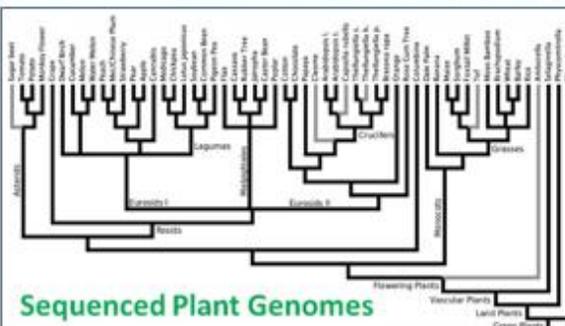
Courses

A variety of PBGG courses were offered in 2013. These courses are either required or recommended for PBGG students, but also are electives for students in other science majors, within and outside of the College of Agricultural and Environmental Sciences.

Plant Breeding (PBGG 6140), taught by Cecilia McGregor, introduces students to the fundamental principles and theories of the science used in plant improvement.



Essential Skills for Graduate Students and Post-Docs (PBGG 8020), taught by Katrien Devos, is a course where graduate students get introduced to a range of topics that will help them to become successful scientists.

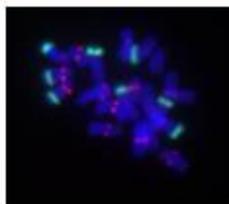


Draft genome sequences are available for more than 50 plant species. Sequence data can be translated into improved crop traits through approaches such as association genetics, genome editing, TILLING, and cisgenesis. Learn more in Dayton Wilde's Translational Genomics class (PBGG 8870).

http://genomeevolution.org/wiki/index.php/Sequenced_plant_genomes

ADVANCED PLANT BREEDING

Advanced Plant Breeding (PBGG 8140), taught by Ali Missaoui, focused on the in-depth assessment of current and emerging breeding methodologies and sources of variation used to achieve plant breeding targets and increase genetic gain from selection. Established breeding methodologies and their genetic basis were covered as well as the integration of traditional with modern genetic and genomic technologies.



All PBGG students participate in Research Seminar (PBGG 8861) and Ph.D. students also take Communication Seminar (PBGG 8860). Both were offered Spring Semester by Wayne Parrott. Another required course for all students is Plant Breeding Practicum (PBGG 6000) taught by Paul Raymer and Brian Schwartz. Students travel to Athens, Tifton, and Griffin to learn about practical aspects of plant breeding by interacting with breeders who work with a wide variety of crops (peanut and muscadine shown below).

Plant Cytogenetics: Behavior and Evolution of the Plant Genome (PBGG 8890), taught by Wayne Parrott explores how classical and molecular cytogenetics can be integrated and applied for plant improvement and genetic studies. Students conduct a project on a plant of choice (teosinte chromosomes above).



Graduates

Two M.S. students completed their PBGG degrees.

 Rattandeep Gill, Phenotyping methods and QTL mapping for late leaf spot resistance in cultivated peanut (*Arachis hypogaea* L.), Peggy Ozias-Akins, Major Professor

 Austin Grimshaw, ACCase herbicide resistance in bermudagrass, Brian Schwartz, Major Professor

New students

 Nicole Bachleda, M.S., Zenglu Li

 Carolina Chavarro, M.S., Scott Jackson and Peggy Ozias-Akins

 Franco Villegas Chirinos, Ph.D., Ali Missaoui

 Josh Clevenger, Ph.D., Peggy Ozias-Akins

 Ruyue Ding, M.S., Ali Missaoui

 Rupesh Gaire, M.S., Dayton Wilde

New Members

 *Ali Missaoui*, Assistant Professor in Crop and Soil Sciences since Jan. 2013, conducts forage and biomass breeding and teaches Advanced Plant Breeding. Find out more at [Ali's Institute profile](#).

 *David Bertioli*, Assistant Research Scientist in the Institute began a two-year sabbatical with Scott Jackson in August. David is Professor at the University of Brasilia and is developing molecular tools to facilitate introgression of useful traits from wild to cultivated peanut.

 *Karen Harris-Shultz* and *Joe Knoll*, USDA-ARS Research Geneticists, are in the Crop Genetics and Breeding Research Unit, Tifton. Both work on warm-season species for turf, forage, and bioenergy. Karen focuses on turf and Joe on bioenergy species. More information about each of their research programs can be found at:

[ARS Personnel - Harris-Shultz](#)

[ARS Personnel - Joe Knoll](#)

New Releases

Cultivar release committees recommended release of five ornamental *Pennisetum* associate cultivars, two soybean germplasm lines and one soybean cultivar, three wheat cultivars and one associate cultivar, and one peanut cultivar. For information on licensing and availability, contact Shelley Fincher (shelleyf@uga.edu) and Brent Marable (marable@uga.edu) in UGA's Technology Commercialization Office.

Recognitions, Achievements, and Leadership Activities

 Several of our students are supported by assistantships/fellowships carrying special recognition

Josh Clevenger, Provost's Scholar of Excellence

Nino Brown, Cotton Incorporated Fellowship

Doug Eudy, National Science Foundation Graduate Research Fellow

Rupesh Gaire, 2013 IPBGG Graduate Assistantship

Zach King, United Soybean Board Fellowship

 *Rajiv Parvathaneni* was awarded a National Science Foundation Doctoral Dissertation Improvement Grant on "RNA-Seq analysis of nascent RNA to provide insights into the mechanisms behind genomic loss of introns".

 *Adam Bray* (Spring semester) and *Josh Clevenger* (Fall Semester) led Journal Club where students and faculty rigorously evaluate recently published works.

 Emeritus Professor and IPBGG member Roger Boerma received the 2013 National Association of Plant Breeder's Plant Breeding Impact Award.



Photos Courtesy of PBGG 6000 Students

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For more information on plant breeding basics, take a look at our [YouTube videos](#) and [Online Textbook](#)