



# NAPB Newsletter

July 2013

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## **Dave Stelly, Past President, Review of 2013 Meetings**

**T**he National Association of Plant Breeders (NAPB) and the Plant Breeding Coordinating Committee (PBCC) held their joint 2013 Meeting June 2-5 in Tampa, Florida. Titled "*Positioning Plant Breeding for the Future*," the meeting focused on how plant breeders, institutions, agencies and companies can optimize the future by recognizing breeding-relevant challenges, opportunities, and trends. Genomics, high-throughput phenotyping, global positioning systems, biotechnologies, and "big data" are among the high-impact opportunities for enhancing plant breeding. Challenges include the need to regain resources and programs to sustain public plant breeding, breeding research and plant breeding education, so that we can provision our nation adequately and sustainably. A major need is to increase societal understanding and thus appreciation for the contributions of plant breeding and agriculture to food security and environmental sustainability on national and international scales. The meeting was launched by a student-organized Sunday evening reception for all attendees. Business and scientific sessions were launched Monday by NAPB President, Dr. David Stelly of

Texas A&M University and PBCC Chair Dr. Allen Van Deynze of the University California at Davis, as well as local host, Dr. Barry Tillman from the University of Florida (UFL). The histories and distinct roles of NAPB and PBCC were clearly delineated by Dr. Eric Young, Director of the Southern Association of Agricultural Experimental Stations. Dr. Mark Brick of the Crop Science Society of America identified areas where coordination with NAPB seems desirable. Dr. Stelly and Dr. Van Deynze summarized events and progress of the past year for NAPB and PBCC, respectively. Future leaders were elected as Secretary of NAPB and PBCC, Dr. David Francis of Ohio State University and Dr. Michael Gore of Cornell University, respectively. Incoming NAPB President Dr. Elizabeth Lee of the University of Guelph and PBCC Chair Dr. Patrick Byrne of Colorado State University assumed their new leadership roles during the meeting, as did incoming NAPB Vice-President Dr. Barry Tillman and PBCC Vice-Chair Dr. Jamie Sherman of Montana State University. The committee structure of NAPB was revamped to include four standing committees: Advocacy, Communications, Education, and Membership. Plans for the 2014 NAPB/PBCC Meetings in Minneapolis August 5-8 were reviewed. Several proposals were presented to host the 2015 NAPB meetings in various US and Canadian locations. NAPB leadership made clear its intention to move planning of meetings 2-3 years in advance. In addition, an appointed panel to include former, present and future meeting hosts will assume responsibilities for NAPB meeting development.

The meeting featured four sessions of invited speakers who addressed topics essential to discussions about how the US might position Plant Breeding in the future. Session themes were 1) Excellence in Plant Breeding, 2) Plant Breeding Education 3) Populations and Phenotypes, and 4) Data Collection, Archiving, and Analysis. Winners of the three NAPB professional awards for 2013 were announced: "Early Career" (Dr. Seth Murray, Texas A&M University), "Impact" (Dr. Roger Boerma, Georgia Seed Development), and "Lifetime Achievement" (Dr. Johnie Jenkins, USDA-ARS). Three students that won a pre-meeting competition for advanced/recent graduate students also gave invited talks on their research - Carmille Bales (Michigan State University), Jozer Mangandi (UFL) and Rebecca Nitcher (UC at Davis). Student poster awards went to Steve Becker (Colorado State University), Jill Recker (North Carolina State University), and Gerardo Nunez (UFL).

Other meeting features included tours, panel-led discussions, workshops, a meeting banquet and a plenary speech by Dr. Molly Jahn of the University of Wisconsin, on "*Agricultural Sustainability and the Future of Plant Breeding*." Posters and sponsor exhibits were displayed throughout the meeting, and a poster-based competition was held for graduate student research. New meeting features were tested: student 1-minute oral descriptions of their posters, and two-minute oral presentations by Gold- and Platinum-level sponsors. Workshops

addressed 1) educational needs, including continuing and non-conventional plant breeding education, 2) the need to gather, assimilate, and use data effectively, and 3) life skills.

Tours highlighted cutting-edge UFL plant breeding at the Gulf Coast Research and Education Center (GCREC) for fresh tomato and juice orange markets. Among the highlights were breeding efforts described by UFL scientists Dr. Jay Scott and Dr. Sam Hutton for tomato flavor, tomato virus, and bacterial disease resistance, and a description of citrus breeding by Dr. Fred Gmitter of the UFL, as well as the ongoing devastation of the citrus industry by "Yellow Dragon Disease" ("Huanglongbing"), also known as citrus greening. The history behind this disease and its multi-billion dollar ramifications underscored why the US needs to re-invigorate its support for plant breeding and agriculture. The continuing "tsunami" of destruction to the Florida citrus industry exemplifies what can and will happen to other important crops without support of plant protection and breeding programs.

#### SESSION and TOUR DETAILS:

Setting the bar and exemplifying the immense impact that plant breeding can have on industries, science, agriculture, and society were three scientific presentations on "EXCELLENCE IN BREEDING" by the three 2012 NAPB professional award winners. Dr. Marv Boerboom (Monsanto), whose corn hybrids occupy millions of acres, described fundamental keys to successful breeding. Dr. Michael Gore (Cornell University, formerly USDA-ARS) piqued everyone's interest with descriptions of a high-throughput field-phenotyping system. Charles Stuber (USDA-ARS, NC State) described his research contributions to the watershed beginnings of molecular marker technology, marker-trait association, the identification of quantitative trait loci (QTLs) for hybrid vigor, and the emergence of marker-assisted selection (MAS) for the development of enhanced maize germplasm. Each presentation afforded compelling reasons for society and individuals to engage and support plant breeding.

In several aspects, Plant Breeding Education is in a state of metamorphosis and diversification. Influential factors include the importance of breeding, rapid incorporation of new technologies in breeding programs, growth of plant breeding for some economically important plants in the commercial sector, web-based and other non-conventional educational options, assimilation of new technologies, and decades of eroded support for public field-breeding programs that educate professional breeders. Thus, NAPB devoted a panel-based session to present and discuss various forms of Plant Breeding Education. These included 1) The Syngenta Breeding Academy by Dr. Heather Merk, 2) Inquiry-based learning and the Plant Breeding and Genomics Community by Dr. Shawn Yarnes, 3) an approach at Western Illinois University emphasizing undergraduate education in plant breeding, by Dr. Winthrop Phippen, 4) the present and future of USDA/NIFA funding for plant breeding education by Dr. Liang-Shiou

Lin, 5) the Monsanto fellowship program, by Dr. Michael Lohuis, and 6) the Dow AgroSciences Professional internship program by Dr. Don Blackburn.

As genomics, phenomics, metabolomics, and other technologies gain momentum, breeders' choices, challenges, and opportunities are multiplied and magnified. These were some of the topics highlighted in the "Populations and Phenotypes" session. EUCARPIA's president, Dr. Beat Boller, led off the session by describing EUCARPIA's efforts to position plant breeding in this century, and the potential for interactions with NAPB, as plant breeding in Europe faces huge opportunities and challenges that are mostly similar to those in the US. Dr. Natalia de-Leon (Univ. of Wisconsin) discussed the use of complementary population structures for genome wide association studies in maize. Dr. Gary Peter (UFL) described historical, cooperative, and largely conventional aspects of the major southern pine breeding program. This was followed by Dr. Patricio Munoz's (UFL) discussion of new features and opportunities created in the forest program through assimilation of genomics data and new statistical methods. UFL strawberry breeder, Dr. Vance Whitaker, described how consumer-assisted selection in strawberry and correlated chemical analyses are paving the way to breed for enhanced flavor, field performance, and yield, and also whetted everyone's appetite for dinner.

Plant breeders face burgeoning opportunities to gather and use various types of data. The session on Data Collection, Archiving, and Analysis included "The iPlant Collaborative: Cyberinfrastructure for plant biology research and applications", by Dr. Stephen Goff (U. Arizona), its Project Director. An active system, the "T3 database" (for Triticeae crops) was presented by USDA scientist Dr. Victoria Blake. The very practical IBP platform by CGIAR was discussed in "The Integrated Breeding Platform: A new portal for modern breeding tools and services" by Dr. Jean-Marcel Ribaut (CIMMYT). Lastly, "The Virtual Lab in Plant Breeding (VLPB)" was discussed by Dr. Rob Dirks (Rijk Zwaan Breeding B.V.).

During the last afternoon of the meeting, attendees chose one of two workshops or a tour of a Dole blueberry facility. The two workshops addressed "Data" and "Life Skills," respectively. In the Data workshop, domestic and international attendees discussed and planned how breeders, data specialists, and web specialists can coordinately move towards developing data systems that enhance plant breeding multi-dimensionally. The Life Skills workshop, "Beyond Science," was led by Dr. Kim Kidwell from Washington State University and Dr. Jamie Sherman of Montana State University. Industry representatives Dr. Don Blackburn (Dow AgroSciences), Dr. Tabare Abadie (Pioneer Hi-Bred Int'l), and Dr. Donn Cummings (Monsanto) shared what industry is looking for in new hires. Industry requires not only good scientists, but also people with a broad array of human capital skills, including teamwork, management, problem solving, communication, and leadership. Students were able to ask industry representatives advice on skills they need to develop. The second half of the workshop focused

on value-based leadership. Students were asked to think about their values and to practice acting in alignment with those values. Survey results indicate the workshop increased awareness of the impact of human relations on scientific contributions and increased knowledge of "beyond science" skills that are appreciated by plant breeder employers. All students surveyed agreed workshop goals were met and the workshop was worth their time. Many have requested similar workshops at future NAPB meetings.

Attendees were reminded that the 2014 annual meeting be in Minneapolis, August 5-8, immediately preceding the American Phytopathological Society meetings Aug. 9-13.

## **A Student's Perspective of the 2013 Annual Meeting**

The 2013 meeting opened with the Graduate Student Mixer. Students, post-docs, faculty, and industry professionals were all present for an enjoyable night of socializing, hors d'oeuvres, and entertainment. It was a great opportunity for our student attendees to network with both future colleagues and potential employers. Many of our students chose to participate in the newly established Student Poster Competition, and the 1-minute oral presentations were very successful in garnering interest for the posters. The unofficial Graduate Student Working Group meeting was held on the second day of the conference and students who showed up volunteered in various capacities to help serve in the working group, as well as liaise with the different subcommittees. Overall, it was a very successful meeting for networking, practicing scientific communication, and helping serve the greater NAPB community.

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## **Please Join NAPB TODAY!**

Would you like to join and support the National Association of Plant Breeders? To join, please go to <http://www.plantbreeding.org/napb/index.htm>, scroll down to "How to join/ Information for new member" and follow the links. Remember that you DO NOT have to be a member of any other professional organization to join NAPB. The tri-societies, ASA-CSSA-SSSA, are handling our membership database and email list server under contract to NAPB.

## **USDA-REE Plant Breeding Stakeholder Listening Session**

The Research, Education, and Economics (REE) Mission Area will hold a Plant Breeding Stakeholder Listening Session, on Thursday, August 15, 2013, at the Department of

Agriculture's (USDA) Jamie L. Whitten Building in Washington, D.C. During the past year, USDA established a Plant Breeding Working Group (PBWG) with representatives from relevant USDA agencies. The PBWG meets regularly and works to make sure that USDA plant breeding efforts are coordinated, non-duplicative, and are poised to take advantage of new and emerging opportunities. The scope of the PBWG includes agronomic, horticultural, and environmental/conservation breeding of crops, plants, and trees. In an effort to improve service to the plant breeding community, the USDA will hold a day of discussion about the future of USDA funded plant breeding and cultivar development. Several questions will be addressed, such as the following. [1] Are current plant breeding efforts fulfilling the needs of agency stakeholders? If not, what is missing? [2] How can we better track and evaluate success in plant breeding, and what are the tools that will enable us to do this? [3] How can we improve connections between plant breeders and end users? [4] How can we better develop the prioritization process for responding to needs? [5] How can we improve connections among Federal programs, community colleges and four year institutions to provide more entry points into plant breeding? [6] What should our national strategy be for training a plant breeding workforce?

NAPB will be represented at the Listening Session. If you can't attend and wish to contribute then contact NAPB leadership with comments.

## **International Plant Breeding Congress**

The International Plant Breeding Congress will meet in Antalya, Turkey on November 10 – 14, 2013. Additional information can be found at <http://www.intpbc.org>.

## **Success Stories**

Crop: Leucaena

State: Hawaii

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Leucaena (“loo-cee-nah”) is a tropical woody legume known well in tropical countries but equally unknown to Americans. Breeding of improved varieties and hybrids in Hawaii since 1962 has led to almost a million acres of production worldwide. This includes 250,000 acres of fuelwood and forage in Andhra Pradesh, India, and 400,000 acres of high-protein fodder in Queensland, Australia. Extensive plantings are underway in countries like Indonesia, Nigeria and Paraguay. Grants to U. Hawaii from USDA and DOE since 1965 supported five germplasm collections throughout Mesoamerica. Evaluations were made of 1100 accessions in Hawaii,

Australia, and SE Asia. This led to the selection of outstanding lines and breeding of many improved hybrids. Included are 75 interspecific hybrids of particular present interest as biofuel and high-value hardwood. These trees are very rapidly growing (harvestable on 4-year cycles), nitrogen-fixing, seedless and benign environmentally. Among new hybrid types are also forage varieties resistant to an international psyllid pest, with outstanding digestibility and drought tolerance. Our limited US public resources have been supplemented recently by major grants to our collaborators in Australia from their Meat and Livestock Association and from Australian Centre for International Agricultural Research. Increased adoption in Hawaii and southern states can be expected of improved Hawaii-based varieties from our Aussie collaborators. Dramatic investments by Americans in crop improvement is called for if we are to reduce hunger (1 billion people) and malnutrition (2 billion) of peoples in the tropics. The leucaena improvements thus represent a little money wisely spent.

## **In Memory**

Kenneth John Frey, 90, of Ames, passed away on July 14, 2013, at Green Hills Retirement Community in Ames, IA. Ken was born in Kalomo, Michigan on March 23, 1923; educated at Cogsdill, a one room country school, from grades 1-8. He attended Michigan State University where he met his future wife, Ann Dunlap, to whom he was married for 68 years. After completing his B.S. and M.S. degrees from Michigan State, he earned his Ph.D. in Agronomy at Iowa State College in 1948. After five years on the faculty at Michigan State, he returned to Iowa State in 1953 and served on the faculty in the Department of Agronomy until his retirement in 1993. He remained active in the Agronomy Department until 2001, 56 years after starting at Iowa State as a graduate student.

Kenneth Frey was recognized both nationally and internationally as a plant breeder. Directing the Oat Breeding Project at Iowa State, he was named George Curtis Distinguished Professor in 1970 and received the ISU Distinguished Alumni award. He was elected President of his Professional Societies, the Crop Science Society of America (1980-81) and the Agronomy Society for America (1983-84). He organized the first International Crop Science Congress held at Iowa State in 1989. In recognition of his contributions to agriculture and science, he received the Genetics and Plant Breeding Award from the National Council of Commercial Plant Breeders (1982), the Dekalb-Pfizer Crop Science Distinguished Career Award (1986), the Iowa Science Medal (1989), and the Henry Wallace Award for Distinguished Service to Agriculture (1990). In 2007, Iowa State University established the Kenneth Frey Endowed Chair in Agronomy. In the 1990s, after his official retirement, he authored the National Plant Breeding Study which has become a blueprint for the development of plant breeding in the US. Internationally, Kenneth Frey served as a consultant to major crop breeding institutes in India,

Mexico, and the Philippines and to the governments of Malaysia and Norway. He served as a Visiting Professor and Lecturer at universities in Sweden, Germany, Egypt, Yugoslavia, and Canada. In addition to his contributions to plant breeding research, Kenneth Frey was also known as an educator, serving as major advisor to over 100 MS and PhD students. He was influential in introducing and integrating women into the field of plant breeding.

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