

Development of the Peanut Genome Initiative

The competitiveness of peanuts in domestic and global markets is threatened by losses in productivity and quality that are attributed to diseases, pests, environmental stresses and allergy or food safety issues. The germplasm repositories and gene banks maintained by the USDA-ARS National Plant Germplasm System (NPGS) and the Consultative Group on International Agricultural Research (CGIAR) typically provide the first line of long-term defense against those problems. In the United States, the Peanut Germplasm Collection at Griffin, Georgia contains ca. 9900 accessions of 72 species from 106 countries. Natural genetic diversity among wild relatives and accessions of cultivated peanut provides the primary means to attain durable resistance or tolerance to major constraints such as peanut root-knot nematode, tomato spotted wilt virus, drought, and pre-harvest aflatoxin contamination. Even so, new technology is needed to facilitate more rapid discovery of genes that confer a remedy to these constraints and the incorporation of those genes into elite germplasm by conventional and biotechnological breeding methods in a timely manner. Genomic, proteomic and bioinformatic research can provide the genetic tools to effectively mine useful genes from the wealth of natural genetic diversity that exists in peanut.

However, to realize such ability, it was necessary to establish an infrastructure for genomic research with a coordinated research approach to guide the effective development of peanut germplasm, genetic tools and bioinformation. On 22-23 March 2004, 26-scientists with expert knowledge of critical fields in genetics and plant molecular biology participated in a workshop hosted by The Peanut Foundation/American Peanut Council in Atlanta Georgia. These scientists reviewed the current status of peanut genomic research, which has been documented in the book entitled, *Legume Crop Genomics* published by AOCS Press under the auspices of the U.S. Legume Crop Genome Initiative (LCGI). In affiliation with LCGI and other stakeholders, the Peanut Genome Initiative (PGI) was launched at this workshop. An advisory committee, representing the broad interests of industry and the peanut research community, was selected to guide the growth of the PGI. A *Strategic Plan for the Peanut Genome Initiative 2004-2008 (v2.4)* was developed that outlined research goals objectives, performance measures and significant near-term milestones representing ‘quantum leaps’ in the advancement of this emerging science.

In 2006, the PGI sought to expand its mission through outreach to the international peanut research community. The foundation for this effort was established in November 2006 in Guangzhou, PRC at the “International Conference on Aflatoxin Management and Genomics” when delegates from nine nations voted to maintain an open dialog to explore opportunities for cooperative research, and to take steps toward achieving that goal with annual meetings. A PGI proposal was accepted to host the second conference of the international peanut research community on October 24-26, 2007 in Atlanta GA. This meeting, *Advances in Arachis through Genomic & Biotechnology: An International Strategic Planning Workshop*, is another committed step toward bringing elite members of the international peanut community together in a manner that fosters research collaboration on high priority issues. The *International Strategic Plan for the Peanut Genome Initiative 2009-2012: Improving Crop Productivity, Protection, Product Safety & Quality* was developed at this workshop.

Since then the tradition of excellence that was established in Guangzhou has been upheld at *Advances In Arachis through Genomics & Biotechnology* (AAGB-2008) at ICRISAT in Hyderabad INDIA and AAGB-2009 in Mali, AFRICA. The level of science continues to rise. On December 8, 2010, PGI convened the first meeting to consider the feasibility of sequencing the Arachis genome. The chronology and progress of that effort is documented under the *International Peanut Mapping Project* on this site.

The official launch of the International Peanut Genome Mapping Project is expected to occur at AAGB-2011 in Brasilia, BRAZIL. In addition, a stakeholder workshop during AAGB-2011 will gather stakeholder input for construction of the *International Strategic Plan for the Peanut Genome Initiative 2012-2016*. As we march forward together, the international peanut research community once again will demonstrate that it is becoming well positioned to address long-term goals that meet the needs of the global peanut value-chain.