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TO: *Journal of Cotton Science* Community

FROM: Steering Committee of the International Cotton Genome Initiative (ICGI)

The last decade has seen unprecedented advances in the use of DNA technology to unravel the genetic secrets of plants and animals, and to genetically engineer hybrid or transgenic organisms. The power of such technology is best seen in the current goal to interpret the human genome at the DNA level. A massive scientific effort is underway to identify, map and characterize all of the genes in the human genome. The impact of this epic venture on human health and well being will be profound and long-lasting.

DNA technology is being applied to a range of agricultural crops. Cotton has been a leader in the research and commercialization of transgene technology, and the consequences for agronomic properties such as insect and herbicide resistance have been momentous. The future of cotton improvement not only depends on the addition of such traits, but also on the understanding of fundamental components of the cotton genome that specifies the unique characteristics of this crop plant.

International collaborative projects are underway to map and characterize the genomes of rice, wheat, maize, soybean and other agronomic crops. Cotton, however, lags significantly behind other crops in the application of DNA technology to the genetic and physical mapping of the genome. Clearly, the scientific and technological effort required to study the complex cotton genome is immense and, realistically, should be addressed by a coordinated, multi-disciplinary endeavor.

With this concept in mind, a small group of scientists from USA, France and Australia met at CSIRO Plant Industry in Canberra, Australia on February 16-18, 2000 to discuss the current status of cotton genetic mapping, DNA markers, genomic research and marker-assisted selection. It was a general agreement of the workshop participants that a public International Cotton Genome

Initiative (ICGI) should be formed to facilitate the development of a saturated and fully integrated genetic and physical map of cotton.

The proposed genetic or linkage map of cotton would be comprised of PCR-based DNA framework markers (such as DNA microsatellites) that are steadily becoming available in the public domain. A consensus linkage map would be produced by analysis of an amalgamation of genetic maps generated around the world by public scientists using a common set of framework markers. This approach is essential because no single mapping population will segregate for all of the genes controlling the many important traits of the cotton plant. The framework DNA markers will be anchored to cytogenetic maps to identify chromosomal linkage groups, and bacterial artificial chromosomes (BAC) libraries will be employed in the construction of the physical map.

Fortunately, some of the requisite genetic mapping data already exists and simply needs to be compiled and analyzed. The principal role of the ICGI will be to coordinate the integration of the genetic and physical maps of cotton within the public domain. Major objectives include the generation of a transportable suite of PCR-based framework markers that can be mapped in any segregating population, the development of the bioinformatic and analytical resources to create a virtual consensus linkage map, and the physical mapping of these PCR markers in public domain BAC resources.

The International Cotton Genome Initiative is designed to advance the integration of the genetic and physical maps of cotton in the public domain. ICGI is open to all scientists globally who are willing to collaborate, share data, and disseminate materials. An initial International Steering Committee (ISC) has been formed to guide this effort. Members of the ISC are Curt Brubaker (CSIRO-Australia), Roy Cantrell (NM State University, USA), Marc Giband (CIRAD-France), Bruce Lyon (University of Sydney, Australia) and Thea Wilkins (UC-Davis, USA). The ISC is charged with the role of coordinating communication among scientists participating in the ICGI and distributing information about the initiative to cotton researchers.

It is recognized that the ICGI will evolve and be refined as more scientists participate. Consequently, the ICGI will provide physical and electronic forums for the discussion of research objectives and the promotion and exchange of ideas. It is intended that the founding meeting of the ICGI will be held in California in January 2001, with the exact time and place to be widely publicized.

The members of the ISC wish to make all interested scientists aware of the International Cotton Genome Initiative and to sincerely invite participation. We believe it will be exciting to be a part of a global effort that will yield fundamental genomic information, which can impact cotton genetic improvement for many years to come.

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