USLCGI
United Soybean Board
USA Dry Pea and Lentil Council
American Soybean Association
American Alfalfa Alliance
National dry Bean Council
Peanut Foundation

The U.S. Legume Crops Genomics Initiative brings together growers and scientists to guide the development of priority research areas that will provide economic benefits and enhance sustainable agronomic practices of American agriculture. Given the importance of the major crop genomes and opportunities to explore interesting biology, six commodity organizations) have endorsed the priority research areas developed by the group.

Legume symbiosis with soil bacteria fixes nearly 17 million tons of atmospheric nitrogen each year, worth about $8 billion. This unique ability of legumes reduces the need for expensive chemical fertilizer, reduces our dependence on petroleum products, and improves soil and water quality. With farmgate value estimated at $22 billion for legume crops and the $8 billion value in nitrogen fixation, the economic value of legumes on the farm is at least $30 billion annually

Important basic and applied opportunities can be gained if extensive genomic resources are developed for a broader range of non-reference species. The alternative is that crop species will be left further behind in the wake of advances in sequence-based biology. The non-model species need strong genomic resources so they can take advantage of genomic advances in recent years. It is important to remember the purpose of genomics – to enhance our understanding of genetics and biological properties so that we can improve the quality of life.

- **Genome Sequencing of Strategic Legume Species**

Sequence gene-rich regions of soybean, common bean, and peanut
Whole-genome sequencing of barrel medic (*Medicago truncatula)*

- **Physical Map Development and Refinement**

Development of physical maps in peanut and common bean
Refinement and/or completion of physical maps in barrel medic and soybean
Development of transcript maps of known genes (ESTs)
Integration of maps among taxonomically key species

- **Functional Analysis: Transcriptional and Genetics**

High through-put stable and transient gene transfer systems
Assignment of gene function Expression analysis
Proteomics, metabolomics, and metabolic reconstruction
Gene knockout systems

- **Development of DNA Markers for Comparative Mapping and Breeding**

Universal set of PCR–based legume Sequence Tag Sites
Establish local and global similarities of different gene arrangements
Quantitative trait loci (QTL) discovery
Determine the levels of genome conservation among the legume crops

- **Characterization and Utilization of Legume Biodiversity**

Broaden and refine legume phylogeny
Establish levels of biodiversity within the different legume crops
Compare closely related species for gene discovery
Crop-microbe co-evolution Multi-gene family evolution
Domestication of legume crops Preserving and utilizing germplasm

- **Development of a Legume Data Resource**

Development of a legume-wide database publicly available through the web
Leverage data from each legume species for greater efficiency

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