



## Improving legume productivity in Africa

### What have we accomplished in the second year (2008–2009)?

Below are a few of the Year 2 research highlights:

#### Genomic resources

- 3,200 microsatellite markers, with at least 142 associated with disease resistance and first cultivated groundnut genetic map.
- 1,536 high-confidence cowpea SNPs selected for an Illumina® GoldenGate Assay and first full physical cowpea map assembled.
- 1,532 genomic and gene-based microsatellites created from cDNA, small insert libraries and BAC end sequences for common bean.
- An expanded chickpea DArT array with 15,360 clones and the first chickpea Illumina® GoldenGate Assay (768 SNPs) made.
- 16,000 SNPs identified, with an average of 616 genes per species.
- Database created to contain all DNA sequences and SNP data related to comparative markers for the four legumes.

#### Marker discovery and validation

- First QTLs for disease resistance in groundnut identified.
- In cowpeas, two QTLs each identified for resistance to flower thrips and for resistance to the fungus *M phaseolina*, and one QTL for root-knot nematode.
- Several bean populations screened with a QTL-based marker for common bacterial blight resistance.
- Two putative QTLs identified for resistance to the *Helicoverpa* pest in chickpeas.
- Minor QTLs for drought-related traits identified in three groundnut populations.
- QTLs for drought currently being validated for cowpeas, already evaluated in bean populations, and identified in chickpeas.

#### Pre-breeding

- Nine groundnut elite varieties identified as good candidates for MABC.
- Elite × elite crosses for MARS have advanced in cowpeas (15) and chickpeas (7).
- 2,524 BC2F1-derived segregants obtained for five advanced backcrosses between drought-tolerant bean parents and three commercial Andean cultivars from Africa.

#### Capacity-building

- Infrastructure, particularly for field phenotyping, secured for all African partner institutions.
- Training for students in TLI.
- More frequent visits by Principal Investigators to African institutions enhanced team-building and African partners became more involved in data analysis.

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