

High-throughput and Economical Marker-assisted Selection for Peanut

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Peanut breeders currently have limited resources to apply molecular breeding tools in their programs and most are only able to afford single marker analysis for specific traits rather than genome-wide genotyping. In order to facilitate translation of marker discovery to marker-assisted breeding, we have tested the accuracy of a genotyping service using a panel of 10 markers designed for the ICRISAT breeding program, but also containing a common marker of interest for a mutant allele of *FAD2B* conferring high oleic to linoleic acid ratio in some genetic backgrounds, including those in our breeding program. At the time, the genotyping service had only used dried leaf punches delivered by the breeder for DNA extraction. Our breeding program has transitioned to seed chips so that at least 15,000 seeds per year can be screened off season. Seed chips also simplify tracking and planting. Using a population expected to segregate for the mutant *fad2b* allele, both leaf punch and seed chip tissues were assayed in Tifton, GA and at Intertek Sweden. Genotypes from both locations and tissue types were 100% in agreement with very little missing data. The cost for DNA extraction and genotyping with a 10-marker panel is 2 USD per sample. Marker panels now can be customized for the needs of individual programs by selection of marker subsets relevant to the breeding materials in a program. This flexibility of design and low cost for 10 data points per sample should be affordable for many US breeding programs.