

Genetic Recombination in a New MAGIC Population of Peanut

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In order to overcome the limitation of allele diversity in bi-parental based inbred populations, a multi-parent advanced generation intercross (MAGIC) population of peanut is under construction. To maximize diversity, 18 founder parents with highly diverse characteristics including morphological, disease resistance, responses to drought stress and aflatoxin accumulation have been intercrossed in a partial MAGIC scheme. Three rounds of crossing are being completed before generation advance. The first round of 9 crosses was accomplished by random 2-way pairings among the founder parents. The second round of 4-way crosses aimed to pair once among the two-way F1 hybrids which yielded 169 4-way F1s from 32 combinations. The genetic materials involved in this study were genotyped by the version 2 *Arachis* SNP array. Known introgressed regions from *Arachis cardenasii* on chromosomes A02, A03, A08 and A09 were mapped among 4-way F1 hybrids. These introgressed regions have been reported to confer disease resistance to peanut root-knot nematode, early leafspot, late leafspot and rust. F1 hybrids with all introgressed regions could be used to test the effect of pyramiding alleles on these major peanut diseases. In addition, unique alleles extracted among the founder parents enable the counting of recombination events and determining allele contributions among these genetic materials.