Impact of Crossing Conditions on the Success of Artificial Hybridization of *Arachis hypogaea*

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In order to protect peanut yield and quality under dynamic farming conditions, pyramiding desirable traits from multiple lines has been the major task for peanut breeders. In addition, dissecting genetic components of heritable traits also relies on the development of large mapping populations. Artificial hybridization is the critical initial step in these processes. Peanut is a self-pollinating crop with a typical yield of less than four seeds per flower; therefore, it requires significant effort to produce sufficient hybrid seeds for subsequent trait selection and/or establishment of mapping populations. A study was conducted to evaluate the effect of multiple factors on the success rate of artificial hybridization assessed by transmission of molecular markers unique to the paternal parent. Six peanut genotypes were crossed with a breeding line homozygous for both high oleic acid and nematode resistance. The impact of operator, pollination time, flower integrity, genotype and environment on hybridization were evaluated. Molecular markers for high oleic acid and nematode resistance were employed to distinguish selfed seeds from hybrids. The data indicate that operator and pollination time significantly affected the success rate of peanut hybridization and the most important factor for attrition of hybrid seeds is fruit loss due to peg damage from wiring or seed decay. Genotype and physical location in the greenhouse also significantly affected crossing success; however, in these two factors were confounded in this study.