

Screening Peanut Recombinant Inbred Lines for Aflatoxin Contamination using in vitro Seed Colonization of *Aspergillus flavus*

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Peanut (*Arachis hypogaea*) production is challenged by contamination from one of the most carcinogenic substances ever discovered. Aflatoxins are dangerous mycotoxins which can cause disease and death to humans and livestock. The *Arachis hypogaea* ssp. *fastigiata* genotype, ICG 1471 has demonstrated some resistance to aflatoxin contamination in replicated studies. In order to better characterize the genetic mechanisms for resistance in this genotype, reciprocal crosses between ICG 1471 and Florida-07 (*A. hypogaea* ssp. *hypogaea*), a known aflatoxin susceptible and high oleic acid cultivar, were made to generate a recombinant inbred line (RIL) population to use for phenotypic screening.

Advanced generation F₆ seeds were inoculated with a transgenic isolate of the aflatoxigenic fungus, *Aspergillus flavus*, strain AF-70-GFP, which constitutively expresses a green fluorescent protein (GFP). Inoculations were performed using a unique in vitro seed colonization method. Seeds from F₆ RILs were assayed one-week post-inoculation for aflatoxin concentration. The RILs demonstrating the highest and lowest levels of resistance to aflatoxin contamination were selected for further testing after an additional cycle of generation advancement in the field. After completing the additional testing on the selected lines, phenotyping data from the F₇ seeds were combined with data from the F₆ seeds to be analyzed. Statistical analyses revealed four unique RILs that exhibited the greatest resistance to aflatoxin contamination among the selected lines. These four lines along with four lines which demonstrated definitive susceptibility will be used for genetic analysis to discover mechanisms for aflatoxin resistance.