

Title: Transcriptional responses in wild peanut genotypes in comparison with GA-06G following thrips-mediated TSWV transmission

Principal Investigators:

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Objectives:

- Assess transcriptional responses in wild peanut genotypes in comparison with cultivated peanut (GA-06G) following thrips-mediated TSWV transmission

Summary:

Despite using TSWV resistant cultivars for the past two decades and genomics' advancements, the genetics of TSWV resistance in peanut is not completely understood. Earlier, we examined peanut transcriptomes following thrips (*F. fusca*)-mediated TSWV inoculation and peanut genome guided assembly. Results of the study were published in 2021 (Catto et al. *Viruses* 2021, 13(7), 1303; <https://doi.org/10.3390/v13071303>). Results indicated that the defense responses in the TSWV-resistant cultivar (Tifguard) were more upregulated than in the case of the susceptible cultivar (Sunoleic 97R). Overall, it is clear that the resistance in TSWV resistant cultivars is not complete, and our research has shown that under increased thrips and/or TSWV pressure, even currently used resistant cultivars could suffer significant yield losses. Therefore, it becomes imperative to identify more concrete sources of TSWV resistance. We are currently involved in screening numerous wild type genotypes against thrips and TSWV in collaboration with Dr. Soraya Bertioli (UGA Plant Pathology). Diploid peanuts and their hybrids were obtained by crossing by Dr. Bertioli. We have been evaluating them for TSWV incidence and TSWV accumulation via thrips-mediated inoculation. We have identified numerous genotypes that presumably show more tolerance/resistance to TSWV than currently used resistant cultivars. Evaluating many genotypes using transcriptomics will be cost prohibitive. We have carefully selected three genotypes and have generated transcriptomes using the Illumina platform-based sequencing. The results in relation to TSWV resistance will be discussed.