

Title: Improved understanding of thrips and TSWV ecology in the peanut production system of Georgia and implications for management

Principal Investigators:

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Objectives:

- Research continuation on thrips ecology (host range and in-field virus detection) with additional focus on thrips-virus interactions.

Summary:

Thrips-transmitted tomato spotted wilt orthotospovirus remains a major problem for peanut production. TSWV infection magnitudes have fluctuated lately with some years being more severe than the others. TSWV issues persist despite ongoing research and using cultivars with field resistance. Thrips (tobacco thrips, *Frankliniella fusca*) biology and TSWV interactions with thrips have been topics of research for the last two decades at least; nevertheless, several questions remain. Though these are issues/questions that have remained for the last two decades, they have not been addressed. The main limitation being technology. The availability of next generation sequencing platforms coupled with improved molecular diagnostics and quantitation tools may help address some of these longstanding knowledge gaps. Using next generation sequencing and other approaches, we have attempted to design a pathoweb or a pathosystem network involving numerous components that contribute to TSWV epidemics in peanut production. The host (peanut), alternate hosts (weeds), thrips, TSWV and other viruses. Sequencing of peanut and weeds revealed the presence of TSWV mainly in peanut and additional viruses in the genus *Potyvirus* and *Polerovirus*. It is not clear as to what percentage of TSWV infected plants in the field are infected with other viruses (mixed-infection), and if mixed-infection had any bearing susceptibility to TSWV in many of the newly-released cultivars. This aspect needs to be researched. Thrips sequencing revealed the presence of TSWV, as expected, but it also revealed the presence of other bunyavirus-like entities. The impact of housing such viruses on thrips biology and transmission of TSWV also is not clear and needs to be researched. Finally, thrips utilization of host plants (peanut and weeds) was examined using three different sets of primers followed by high throughput sequencing. The results of all these approaches along with component interactions will be discussed in relevance to thrips-TSWV ecology and management during the presentation.