

**Georgia Peanut Commission: (UGAT-30-19/20)**

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**Title:** *Nonchemical-based sprays for triggering host resistance: A new biotechnological approach to manage Tomato spotted wilt orthotospovirus (TSWV).*

**Principal Investigator:**

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**Layman's Summary:**

Tomato spotted wilt (TSW) is a disease that has the potential to cause serious yield loss in peanut, tobacco, pepper, and tomato fields in Georgia and other southern United States. TSW is caused by Tomato spotted wilt virus (TSWV) that is transmitted primarily by tobacco thrips and western flower thrips. Management of TSW in the crop can be very complex by controlling thrips is difficult since thrips can transmit the virus within minutes of active feeding. Thus, insecticides might not act quickly enough to prevent the transmission unless they interfere with or prevent thrips feeding. In the present study, we used a non-transgenic strategy to induce RNA interference (RNAi) in *Nicotiana tabacum* plants against TSWV. Double-stranded RNA (dsRNA) molecules for the NSs (TSWV silencing suppressor) and N (Nucleoprotein) genes were produced by a two-step PCR approach followed by *in vitro* transcription. The application of TSWV\_N dsRNA molecules onto tobacco plants induced resistance against TSWV infection as compared. This study also reported the systemic spread of TSWV\_N dsRNAs from the treated (local) to non-treated (systemic) leaves. The technology implicated could represent an environmentally safe and simple way to control plant viruses in contrast to the introduction of virus disease-resistant transgenic crops in agriculture.