

Monitoring TSWV in Alabama Peanut Fields

Lucinda G. McEachin^{1,*}, Alana L. Jacobson², Amanda Strayer-Scherer³, Scott H. Graham³, Kathleen Martin³, Claire A. Cooke⁴, Livleen Kaur⁴, H. L. Campbell⁵, H. B. Miller⁶, C. Parker⁷

¹ Undergraduate Student, Department of Horticulture, Auburn University

² Associate Professor, Department of Entomology & Plant Pathology, Auburn University

³ Assistant Professor, Department of Entomology & Plant Pathology, Auburn University

⁴ Graduate Student, Department of Entomology & Plant Pathology, Auburn University

⁵ Lab Technician, Department of Entomology & Plant Pathology, Auburn University

⁶ Associate Director, Brewton Agricultural Research Unit Auburn University

⁷ Associate Director, Gulf Coast Research and Education Center, Auburn University

Tomato spotted wilt virus (TSWV) is a plant virus transmitted exclusively by thrips, as seen in Figure 1. The symptoms of TSWV are wilted, young leaves, stunted growth, ring spots on leaves and pods, and reduced yields (Culbreath et al., 2003). Thrips transmit the virus in a persistent-propagative manner, meaning the adult insects can transmit the virus to new hosts for their lifetime because the virus infects and replicates within the insect tissues (LaTora et al., 2022). During the 1990s, up to 100% infected plants were observed in the southeast, and losses from the virus were estimated to be \$12.3 million from 1996-2006 in Georgia peanuts alone (Riley et al., 2011). TSWV disease symptoms have been greatly reduced since the 1990s outbreak, primarily by resistant varieties, insecticides, and cultural practices (Kemerait, 2020). However, a resurgence of TSWV has been reported in the southeast and mid-south U.S. (Sundarai, et al, 2014). This research aims to quantify TSWV incidence in Alabama peanuts.

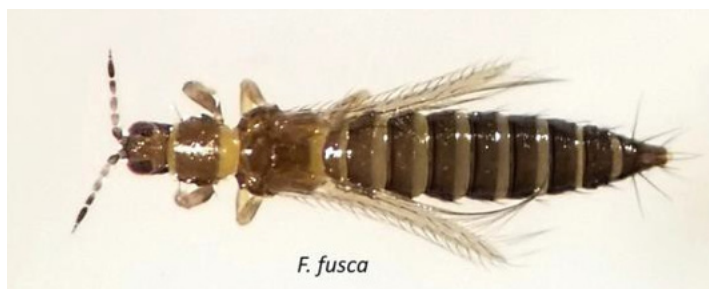


Fig. 1. *Frankliniella fusca*, also known as tobacco thrips

TSWV symptoms were monitored on small plot research trials in Headland, Brewton, and Fairhope during July of 2022. Up to 3-12 standard local varieties including Tuf 297, Flo 331, Flo T61, GA 06G, GA 16HO, AU 17, GA 20VHO, GA 14N, GA 12Y, GA 19HP, GA 18RU,

and GA 09B were planted in research trials. Plots at Headland, Brewton, and Fairhope consisted of two, 25', 20', and 30' rows respectively. The middle two rows of each plot were visually inspected for symptoms caused by TSWV. Data was recorded as the number of row feet infected by counting the number of one-foot sections expressing TSWV symptoms and calculating the proportion of total row length infected (Culbreath et al., 1997). As seen in Figure 2, leaflets expressing symptoms were photographed and collected in a labeled bag with the location, date, row number, and cultivar. The samples were taken to the lab and placed in cold storage.



Fig. 2. Peanut plant expressing TSWV in Brewton

All samples taken to the lab tested positive for TSWV using RT-PCR. TSWV incidence was variable among the three locations. The average number of infected-row feet per plot calculated for Fairhope, Brewton, and Headland was 0.59, 2.45, and 0.26 respectively. Brewton experienced the most TSWV incidence, and there could be several reasons for that, such as increase temperature, humidity, and long dry seasons.

* Corresponding author: lgm0040@auburn.edu

Statement of Research Advisor

Lucinda gained valuable field research experience contributing to larger projects aimed at surveying the incidence of TSWV in Alabama peanuts. She assisted with rating plots for early-season crop damage caused by thrips vectors of TSWV, and learned how to recognize symptoms and rate incidence of TSWV in peanuts mid-to late-season when crop disease is apparent. Lucinda's efforts at three research stations helped to generate viable data on virus incidence in commercially available cultivars grown across the state that can be shared with stakeholder communities of interest.

- Dr. Alana Jacobson, *Entomology and Plant Pathology, College of Agriculture*

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Authors Biography



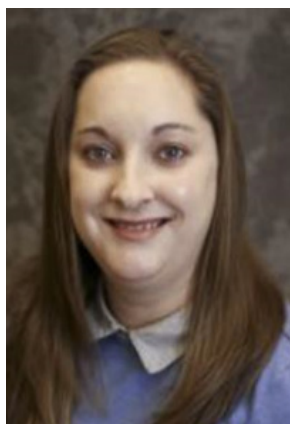
Lucinda McEachin is a senior-year student pursuing a B.S. degree in Horticulture at Auburn University. She collected thrips feeding damage and subsequent TSWV infection data in Summer 2022. In Summer 2023, she will begin a master's program under Dr. Timothy Brenneman at the University of Georgia to study peanut seedling disease.



Dr. Alana Jacobson is an associate professor in the Department of Entomology & Plant Pathology at Auburn University. Her research program investigates the biology, ecology and management of insect pests and insect vectors of plant viruses.



Dr. Scott Graham is an assistant professor and Extension Specialist in the Department of Entomology and Plant Pathology at Auburn University. His research focuses on developing integrated pest management solutions for insect pests of cotton, soybean and peanut.



Dr. Amanda Strayer-Scherer is an assistant professor and extension specialist in the Entomology & Plant Pathology department at Auburn University. Her research largely focuses on plant disease diagnostics and evaluating alternative approaches for managing diseases of tomatoes, such as bacterial spot, early blight of tomato, and late blight of tomato.



Claire Cooke is a master's student working under Dr. Scott Graham in the Department of Entomology & Plant Pathology at Auburn University. Her research is focused on assessing different management practices to control thrips and tomato spotted wilt virus in peanuts grown in Alabama.



Dr. Kathleen Martin is an assistant professor in the Department of Entomology & Plant Pathology at Auburn University. Her lab studies plant viruses in the state of Alabama, including cotton leafroll dwarf virus (CLRVD), Soybean vein necrosis virus (SVNV), and TSWV.



Brad Miller is an Associate Research Director of the Brewton Agricultural Research Unit with a demonstrated history of working in the higher education industry. He is skilled in research, budgeting, customer service, higher education, and science.



Livleen Kaur is an MS Plant Pathology student at Auburn University under the supervision of Dr. Amanda Strayer-Scherer. She is working on Integrated Disease Management of peanut leaf spots. In Fall 2023, she will begin her Ph.D. at Penn State University to study phyllosphere microbiome under Dr. Kevin L. Hockett.



Christopher Parker is an Associate Research Director of the Gulf Coast Research and Education Center in Fairhope, AL.



H. L. Campbell is a lab technician in the Department of Entomology & Plant Pathology at Auburn University.