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Two-Spot Cotton Leafhopper (Cotton Jassid)

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Introduction

The two-spot cotton leafhopper (TSCL), *Amrasca biguttula* (Ishida, 1912) (Hemiptera: Cicadellidae), is one of the most serious sap-sucking insect pests of cotton and several other crops (Fig. 1). Native to Asia and Oceania, TSCL has long been recognized as a major threat to cotton production in those regions. It is also commonly known as "cotton jassid" or "two-spotted cotton leafhopper."

The pest was first detected in the U.S. Virgin Islands and Puerto Rico in spring 2023. It was next reported in Florida in 2024. By the end of 2025, it was found in multiple states, including Alabama, Florida, Georgia, Louisiana, Mississippi, North and South Carolina, Tennessee, and Texas, indicating rapid spread and establishment (Esquivel et al., 2025). It is now a major concern for both cotton and ornamental plant production in the southeastern United States. Early detection and implementation of integrated pest management (IPM) strategies are essential to limit its economic impact.

Biology and Life Cycle The two-spot cotton leafhopper may produce up to 11 generations per year under favorable conditions. Development from egg to adult ranges from 15 to 46 days, depending on the host plant, temperature, and relative humidity. Optimal conditions for population growth include temperatures around 80°F, relative humidity near 70%, and low rainfall. Females insert their eggs just beneath the leaf surface, primarily on the underside of leaves. Eggs are commonly along the midrib or middle vein of the leaf and are best viewed with a microscope. Individual TSCL females typically lay 20 to 25 eggs, although some studies report 14 to 38 eggs per female (Brewer et al., 2025). Eggs hatch within three to seven days. Newly hatched nymphs are 1-2 mm (0.04-0.08 in) long, wingless, pale green, and feed on the underside of leaves. They pass through five instars (juvenile stages) over eight to eleven days before reaching adulthood. Adults live approximately two to three weeks, during which they continue to feed and reproduce, contributing to rapid population growth. Adult leafhoppers are pale green and measure about 2-3 mm (0.08-0.12 in) long, similar in size to the potato leafhopper. They have a distinct dark spot on each forewing and often two dark spots on the head, which helps differentiate adults from similar leafhopper species (Brewer et al., 2025).

Figure 1. *Adult two-spot cotton leafhopper with two black spots at the tip of the forewings indicated by circle (left) and a wingless nymph feeding between leaf veins (right). Photo credits: Kripa Dhakal (left) and Karla Addesso (right), Tennessee State University, TN.*

Host Range

The two-spot cotton leafhopper is an emerging invasive pest in the United States, affecting cotton, vegetables, and ornamental plants. It has a broad host range and has been reported on at least 27 plant species (Brewer et al., 2025). TSCL has been reported to reproduce on cotton (*Gossypium* spp.) as well as other Malvaceae species, including tropical hibiscus (*Hibiscus rosa-sinensis)*, *H. mutabilis* × *H. moscheutos* hybrids, Rose of Sharon (*H. syriacus*), and okra (*Abelmoschus esculentus*). Some potential hosts include eggplant (*Solanum melongena*), watermelon (*Citrullus lanatus*), muskmelon (*Cucumis melo*), cucumber (*Cucumis sativus*), bottle gourd (*Lagenaria siceraria*), sponge gourd (*Luffa cylindrica*), sunflower (*Helianthus annuus*), potato (*Solanum tuberosum),* and sesame (*Sesamum indicum*). Several weed species also serve as potential hosts, including common wireweed (*Sida acuta* Burm.f.), flannel weed (*Sida cordifolia*), black nightshade (*Solanum nigrum* L.), Indian mallow (*Abutilon indicum*), burweed (*Triumfetta* spp.), and other Malvaceae or Asteraceae weeds commonly found along field margins. Damage has been observed on these potential host species and TSCL have been collected, however it is unknown whether TSCL would be able to overwinter and reproduce on all of these species. Some plants may serve as incidental or non-reproductive hosts, such as croton (*Codiaeum variegatum*), poinsettia (*Euphorbia pulcherrima*), rose (*Rosa* sp.), marigold (*Tagetes* spp.), pepper (*Capsicum annuum*), tomato (*Solanum lycopersicum*), and sweet basil (*Ocimum basilicum*).

Damage Symptoms

Both adults and nymphs cause significant damage by inserting their mouthparts into the underside of leaves and extracting sap. This feeding results in a condition known as ‘hopperburn’, characterized by leaf curling, wilting, and discoloration ranging from yellow to red or brown (Fig. 2) (Sparks, 2025). Severe infestations can stunt plant growth and cause defoliation. Because leafhoppers are small and difficult to detect, hopperburn symptoms are often observed before the pests are noticed. Field observations indicate that infestations and plant injury are often more

Figure 2. *Two-spot cotton leafhopper hopper burn damage on okra (left) and tropical hibiscus foliage (right). Photo credits: Zach Snipes, Clemson University, SC (left). Karla Addesso, Tennessee State University, TN (right)*

severe along field margins. Symptoms may continue to develop even after the leafhoppers are killed due to salivary toxins injected into plants during feeding.

Management

Scouting

As this is an emerging pest in the southeastern U.S., specific best management practices (BMPs) are still being evaluated. In the meantime, general BMPs are recommended, such as scouting plants regularly, keeping new, known host plants separate from other potential hosts (quarantine for at least one week), and if using an insecticide, rotate the IRAC (Insecticide Resistance Action Committee) group number with each application to avoid resistance development in the TSCL population. Newly received plants may not have visible nymphs or adult TSCLs but may have eggs, which hatch in approximately seven days (depending on environmental conditions), making quarantining a potentially useful practice. When scouting plants, focus on the leaf underside where the non-flying nymphs are likely to be found. Additionally, they may be found on the upper part of the plant, depending on the host species or cultivar. Field surveys conducted by University of Georgia (UGA) researchers found that both nymphs and adult TSCL were more abundant on leaves in the upper canopy than in the lower canopy of Rose of Sharon hibiscus (*H. syriacus*) (Attia and Joseph, 2026). The UGA researchers also found that TSCL population densities differed by cultivar of Rose of Sharon. Further scouting methods include: 1) firmly tapping a leaf or stem over a tray containing ethanol (or similar alcohol) and examining what is collected, or 2) removing any symptomatic leaves and placing them in a sealable bag for

examination. As inspecting every leaf is not practical, blocks of plants can be monitored with yellow sticky cards (place ~1 card/1,000 sq. ft. of plant area), which should then be examined using a hand lens (10×) or higher magnification; consult with a local Extension Office for aid in identification.

Recent Research Findings – 2025

Preliminary lab tests at the University of Florida (UF) with tropical hibiscus (*H. rosa-sinensis*) as the host plant showed potential lethal effects on adult TSCL of tolfenpyrad (Hachi-Hachi® SC), acephate (Acephate® 97 UP), and mineral oil (Suffoil-X®). Similarly, research conducted at the Clemson University Pee Dee Research and Education Center showed flupyradifurone (Altus®) and tolfenpyrad (Hachi-Hachi® SC) were effective on TSCL on ornamental hibiscus (*H. rosa-sinensis* 'Hot Shot') with notable differences in control and residual activity (Yadav et al., 2026). In addition to chemical control, biological control using insects that feed on TSCL also proved effective; for example, young stages of the green lacewing (*Chrysoperla* spp.) fed on TSCL adults and nymphs in the UF lab (Brewer et al., 2025). Other generalist predatory insects (for example: lady beetles, spiders) also likely contribute to feeding on TSCL in field conditions, though data are still limited. Preliminary insecticide efficacy field trials conducted in cotton during 2025 by the Southeast Row Crop Entomology Working Group showed that the insecticides containing active ingredients dinotefuran, flupyradifurone, buprofezin, flonicamid, and isocycloseram provided more than 80 percent control of TSCL. In contrast, field studies in cotton by UGA researchers found products containing bifenthrin as the active ingredient did not provide acceptable control, which could indicate resistance to the pyrethroid class of insecticides. An IPM approach is recommended by quarantining new, potential hosts, scouting for populations, and rotating products by IRAC code to prevent resistance development. Always follow the pesticide label instructions when using chemical controls.

Conclusion

The recent establishment of the two-spot cotton leafhopper in the United States poses a significant threat to cotton and ornamental plant industries. Its broad host range, rapid reproductive cycle, and expanding geographic distribution make early detection and IPM critical. The adoption of sanitation practices, quarantine measures, and the integration of chemical and biological control strategies will be essential to reducing its impacts and preventing widespread establishment. If you have seen this pest or signs of pest damage, immediately report it to the Tennessee Department of Agriculture's Report a Pest website:

https://stateoftennessee.formstack.com/forms/report_a_pest

References

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For additional information, contact your local nursery specialist at:

Tennessee State University, Otis L. Floyd Nursery Research Center

472 Cadillac Lane, McMinnville, TN 37110

http://www.tnstate.edu/agriculture/nrc/

931-259-4824

Precautionary Statement

To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label.

Disclaimer

This publication contains insecticide recommendations that are subject to change at any time. The recommendations in this publication are provided only as a guide. It is always the insecticide applicator's responsibility, by law, to read and follow all current label directions for the specific insecticide being used. The label always takes precedence over the recommendations found in this publication. Use of trade, brand, or active ingredient names in this publication is for clarity and information; it does not imply approval of the product to the exclusion of others that may be of similar and suitable composition, nor does it guarantee or warrant the standard of the product. The author(s) and Tennessee State University assume no liability resulting from the use of these recommendations.

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