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CHILLI THRIPS IN COTTON

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Chilli thrips (*Scirtothrips dorsalis Hood*) (*Thysanoptera: Thripidae*) are thought to have originated from Southeast Asia, although they are now widely distributed through most of the world—including India, Japan, most of Africa, much of the Caribbean and South America, and are quickly becoming established in the United States. They were first detected in Florida in 1991 and in nursery stock in Southeast Texas in 2005. Chilli thrips are known to infest an impressively wide range of host plants, more than 225 species from at least 40 different plant families, and the list will likely continue to grow as they expand their range. Their main wild (or native) host plants are in the bean family, Fabaceae.

Among other known plant hosts are numerous important crops, including citrus, corn, cotton, eggplant, melon, peanut, pepper, strawberry, tobacco, and tomato. In 2018, chilli thrips were detected in citrus groves in the Texas Lower Rio Grande Valley (LRGV), and in 2020 significant populations were detected in late-season cotton. A survey is underway throughout the LRGV to determine what hosts chilli thrips infest throughout the year. It appears this thrips is now established in the landscape of South Texas, where it has the potential to become a perennial pest on a wide range of crops grown throughout much of Texas.

IDENTIFICATION, BIOLOGY AND DAMAGE:

Chilli thrips are tiny (≈ 2 millimeters long), cigar-shaped insects. Adults are pale in color with black, feathery wings and dark spots that form incomplete stripes on the top of the abdomen (Fig. 1). Adult females insert their small, kidney-shaped, creamy white eggs into plant tissue. An adult female can lay from 60 to 200 eggs, which cannot be detected by the naked eye. Eggs hatch within 2 to 7 days, depending on temperature and humidity. Larvae are wingless, but otherwise look similar to adults, and pass through two stages within 8 to 10 days before pupation.

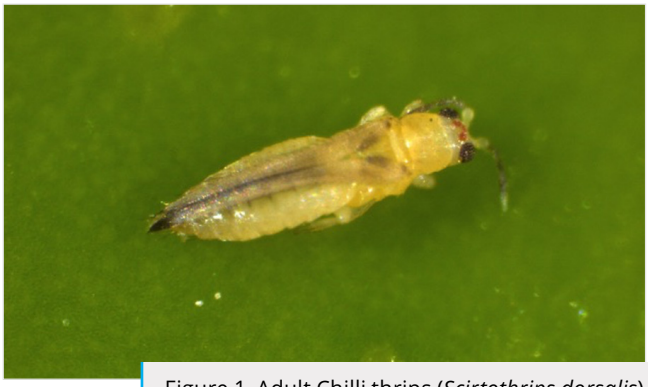

Figure 1. Adult Chilli thrips (*Scirtothrips dorsalis*). *Photo by Dr. Mamoudou Sétamou*

While they have been detected in several fall and winter crops in the LRGV, it appears that they largely overwinter in weeds and plant debris. Their survival and reproduction are favored by hot temperatures. In South Texas, populations build up rapidly in late July and August in cotton. When cotton senesces, chilli thrips migrate to citrus groves where they feed on tender fall foliage. Larvae and adult chilli thrips congregate along the midrib or margins of leaves. The length of time it takes to complete their life cycle varies depending on the temperature and host plant but ranges from 14 to 20 days. Their large reproductive capacity and quick generation time means that chilli thrips' populations can increase rapidly.

Distinguishing chilli thrips from other thrips species is difficult, requires magnification, and some knowledge of

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insect taxonomy. Chilli thrips are most often recognized based on their behavior and the type of damage they cause. They are only about a quarter of the size of Western flower thrips (*Frankliniella occidentalis*), which are commonly found in cotton blooms where they feed on pollen. Chilli thrips are found on the undersides of leaves, close to leaf veins, and tend to favor the tender, new leaves at the top of the plant—but will distribute downward to more mature leaves or feed on the upper surfaces of leaves as populations increase (Fig. 2). Like other thrips, they have piercing and sucking mouthparts that they use to extract material from individual epidermal plant cells. Cell death leads to a characteristic bronzing of cotton leaves and may cause them to curl, distort, and/or turn brittle and drop from the plant (Fig. 3).

Figure 2. Chilli thrips on the underside of a cotton leaf where they remain near the leaf veins.
Photo by Holly Davis.

Figure 3. Bronzing of a cotton leaf caused by chilli thrips feeding.
Photo by Holly Davis

Chilli thrips feeding in cotton cause leaf silvering, bronzing, or distortion, which can be mistaken for injury by herbicides, spider mites, or other late-season thrips such as bean thrips (*Caliothrips fasciatus*) and desert thrips (*Kurtomathrips morrilli*) (Fig. 4). Although chilli thrips have only been detected in Texas cotton post boll-development, thrips in younger cotton may feed on developing squares, which may lead to yield reduction.

Figure 4. Field with bronzing caused by chilli thrips feeding.
Photo by Danielle Sekula

MONITORING AND CONTROL:

To sample for thrips, tap the terminal portion of plants over a white piece of paper or into a white bucket and examine with a hand-held lens or magnifying glass. Yellow sticky cards can be placed in fields, down in the cotton canopy, and checked weekly to detect adult chilli thrips. However, determining thrips species from sticky traps can be difficult and should be confirmed by looking at the underside of leaves using a hand-held lens.

Currently, there is no established action threshold for chilli thrips in cotton. Populations in Texas cotton have only reached significant levels late in the season and treatments are not recommended beyond 650 to 750 DD60s beyond cutout or NAWF +5. If the bolls are mature (e.g., cutting the boll open and seeds have well defined cotyledons and seed coat versus those that are watery seeds), they will likely not be significantly impacted by foliar damage from chilli thrips. If there are numerous immature bolls present, treatment may be justified to prevent yield loss and/or reduction in lint quality. Other than leaf desiccation due to feeding, they do not produce honeydew or create any threat to open bolls.

If it is determined that treatment is necessary, choice of insecticide is important. Efficacy work in Texas and Florida have demonstrated that pyrethroids are not effective for controlling chilli thrips. Cyantraniliprole is moderately effective, while spinetoram and Spinosad consistently provide acceptable control. Acephate may provide good initial control of thrips, but it will also reduce beneficials—potentially "flaring" thrips and other pests such as whiteflies and spider mites. If multiple insecticide applications are required, it is recommended to rotate between insecticides from different classes,

or with different modes of action to help prevent the development of insecticide resistance in chilli thrips and other insect pests in cotton.

Chilli thrips do have some natural enemies, including minute pirate bugs (*Orius* sp.), lacewings, and predatory mites and thrips. While these predators may not always be able to provide adequate control of chilli thrips, they do reduce thrips and other cotton pests. Thus, they should be preserved as part of a good IPM program.

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