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Thrips parvispinus Identification, Damage, and Management

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Thrips parvispinus (Karny) is an invasive insect pest that poses a serious global threat to vegetables and ornamentals in both fields and greenhouses. Originally from Asia, this species has spread to multiple regions around the world, including parts of Africa, Australia, Europe, and North America.

In the United States, *T. parvispinus* first became established in Florida in 2020 and has since been detected in other states, including Georgia, South Carolina, North Carolina, Colorado, Michigan, and Wisconsin. This highly ***polyphagous*** (feeds on various kinds of plants) thrips species develops into large populations and disperses rapidly, causing extensive damage to the leaves, flowers, fruits, and shoots of plants. (Note that thrips is both the singular and plural noun for this insect.)

Identification

Adult *T. parvispinus* are small, slender insects with fringed wings that are difficult to detect without magnification.

Figure 1. Adult Female *Thrips parvispinus* on a Pepper Leaf.
Photo: Navdeep Kaur, University of Georgia.

Females are approximately 1 mm long, with dark brown to black bodies and light-colored legs and head. Their wings are pale near the base (Figure 1).

Figure 2. First-Stage *Thrips parvispinus* Larva.
Photo: Navdeep Kaur, University of Georgia.

Males are entirely yellow and measure about 0.6 mm in length. The first instar larva is translucent white (Figure 2), while the second instar is pale yellow (Figure 3). These larvae feed on plant tissues for several days before pupating and emerging as adults.

Figure 3. Second-Stage *Thrips parvispinus* Larva.
Photo: Navdeep Kaur, University of Georgia.

The life cycle of *T. parvispinus* consists of six stages: an egg, two larval stages, prepupa, pupa, and adult (Figure 4).

Figure 4. The Complete Life Cycle of *Thrips parvispinus*. Eggs are inserted into plant tissues (leaves, petiole, stem); the first and second instars are found on leaves; prepupae are found on leaves and in soil; pupae are found in soil; and adults are present on flowers and leaves.
Illustration: Theresa Villanassery.

Females lay eggs—up to 15 eggs during their lifetime—by inserting them individually into leaves, petioles, bracts, petals, and developing fruits. They can complete their life cycle in about 15–17 days under optimal conditions (a temperature of 27□±□1□°C and a relative humidity of 65% ± 5%), resulting in over 20 generations per year.

Various life stages overlap when the thrips population is high. Their short life cycle and rapid development enable them to cause serious damage in a short period of time.

Host Range

T. parvispinus has a wide host range, with approximately 100 plant species from 39 families worldwide. Notable vegetable hosts include peppers (*Capsicum annuum*), eggplants (*Solanum melongena*), cucumbers (*Cucumis sativus*), potatoes (*Solanum tuberosum*), and watermelons (*Citrullus lanatus*). Ornamental hosts include gardenia (*Gardenia jasminoides*), mandevilla (*Mandevilla* spp.), anthurium (*Anthurium andraeanum*), hoya (*Hoya* spp.), and chrysanthemum (*Chrysanthemum* spp.).

Damage Symptoms

Thrips parvispinus use their rasping-sucking mouthparts to puncture plant cells and extract the cell contents. Larvae and adults both primarily feed on developing leaves, buds, and flowers.

Infested leaves exhibit light-colored spots that gradually turn brown or develop into silver scars (Figures 5A–D). Feeding damage leads to distorted growth, curled leaves, and premature defoliation (Figure 5E). Excessive stippling and scratches on the undersides of the leaves result in chlorosis from chlorophyll loss, which can sometimes progress to a yellow or reddish-brown coloration. At higher infestation levels, leaves may show a burned or scorched appearance (Figure 5A).

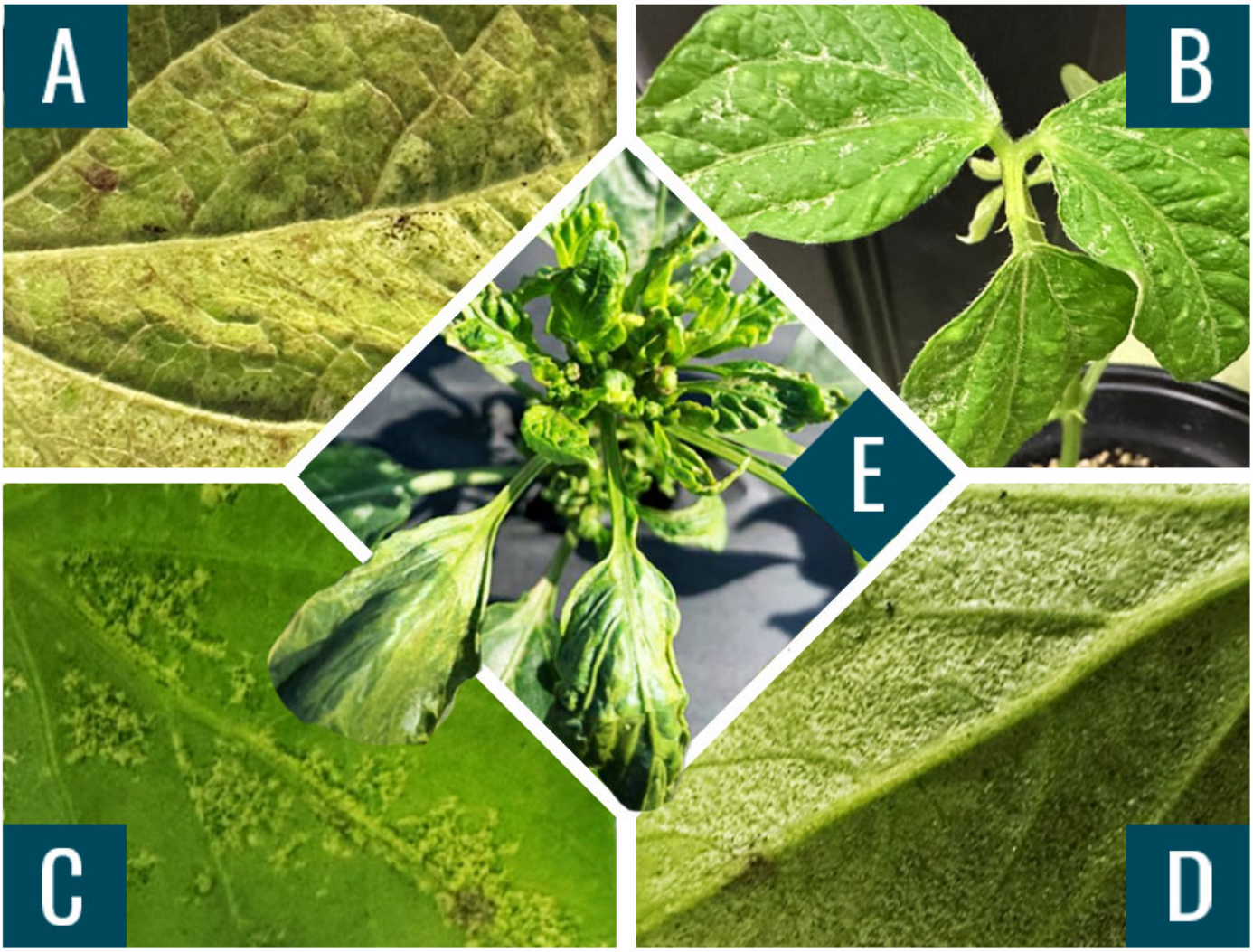

Figure 5. Symptoms of *Thrips parvispinus* Damage. A) Bean leaf showing characteristic damage and an adult thrips (oblong dark area in the left side of the image). B) Typical silvery stippling and chlorotic patches on a bean plant infested by *T. parvispinus*. C) Upper and D) lower surfaces of a pepper leaf displaying typical symptoms of a *T. parvispinus* attack. E) Thrips feeding damage on a pepper plant.

Photos: A–D. Navdeep Kaur, University of Georgia; E. Anna Mészáros, commercial vegetable Extension agent, University of Florida IFAS Extension, Palm Beach County.

Feeding on buds and flowers causes discoloration and deformation, reducing the yields of vegetables and the market values of ornamentals (Figure 6).

Figure 6. *Thrips parvispinus*☐Adult Females (red arrows) on Pepper and Squash Flowers.
Photos: Anna Mészáros, commercial vegetable Extension agent, University of Florida IFAS Extension, Palm Beach County.

On fruits, thrips feeding results in scars and blemishes that compromise quality and marketability (Figure 7).

Figure 7. *Thrips parvispinus*☐Feeding Damage on a Pepper Fruit.
Photo: Anna Mészáros, commercial vegetable Extension agent, University of Florida IFAS Extension, Palm Beach County.

The symptoms may closely resemble damage from broad mites. Severe infestations can stunt plant growth and lower yield. Feeding damage also creates potential infection sites for secondary pathogens like the fungus *Cladosporium*.

Management Strategies

Monitoring and Scouting

Regularly inspecting plants, particularly new leaves and flowers, for signs of thrips damage is critical for preventing thrips populations from causing economic damage. Tapping plants over a white sheet of paper or tray helps dislodge thrips for easier detection using a hand lens or visor at 20X magnification. Yellow sticky traps placed at the plant canopy level at regular intervals throughout the crop also are effective for monitoring adult thrips populations.

Cultural Controls

Proper sanitation is essential for managing thrips. Infested plant material and weeds that can support thrips populations must be removed from the growing area and destroyed. For cutting propagation materials, use a clean, pest-free mother plant and apply preventative dips (e.g., insecticidal soap or horticultural oils) before planting. A follow-up dip of rooted cuttings during transplanting helps reduce the emergence of eggs or larvae that were not initially controlled.

Biological Controls

Several natural enemies have been assessed for managing *T. parvispinus*, with differing levels of success. The most effective biological control is using predatory mites like *Amblyseius swirskii*, *Neoseiulus cucumeris*,☐*Amblyseius andersoni*,☐and☐*Amblyseius degenerans*, which have shown significant effectiveness in controlling the first larval stage, with *A. swirskii*☐and☐*A. degenerans*☐also feeding on the prepupal stage. *Anystis baccarum*☐can consume the second larval stage, prepupae, and pupae. These mites are commercially available and can be applied preventively or at the beginning of an infestation.

Other beneficial insects, such as minute pirate bugs (*Orius insidiosus*), green lacewings (*Chrysoperla carnea*), and brown lacewings (*Micromus variegatus*), also have been used in integrated pest management programs. However, their effectiveness specifically against *T. parvispinus* varies, and further research is needed.

Implementing a biological control program requires careful monitoring and often is used with other management strategies to achieve the most effective results.

Chemical Controls

Chemicals reported to be effective at managing *T. parvispinus* include products containing the active ingredients acephate (IRAC Group 1B), abamectin (Group 6), chlorfenapyr (Group 13), spinosad (Group 5), sulfoxaflor-spinetoram (Group 4C and 5), acetamiprid (Group 4A), cyclaniliprole (Group 28), novaluron (Group 15), and pyridalyl (Group UN; these are compounds with unknown or uncertain modes of action). Additionally, insecticides such as flupyradifurone (Group 4D) and cyantraniliprole (Group 28) have shown promising results, especially for ornamental crops. Chlorfenapyr and pyridalyl are only registered for use in greenhouses, while the remaining active ingredients are registered for use in nurseries and greenhouses.

Biorational products, such as 3% mineral oil and sesame oil, can also be integrated into management programs, providing alternative controls with reduced nontarget impacts. However, because of the high reproductive rate and potential for resistance development in *T. parvispinus*, it is crucial to rotate insecticides with different modes of action (as classified by IRAC). When using chemicals, always follow label instructions and consult your local Extension service for region-specific recommendations.

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