

Biological Control Sub-group
8/22/2008
Chilli Thrips Technical Working Group

Research Completed to date:

- I. Two natural enemies identified as attacking *S. dorsalis* in the Caribbean:
 - a. *Orius insidiosus* – both adults and larvae appear to attack chilli thrips
 - b. *Franklinothrips vespiformis* – adult forms but do not know about larval forms.
 - c. Both predators recovered in large numbers from cotton in Barbados.

- II. Commercially available natural enemies tested in greenhouses.
 - a. Texas
 - i. *Orius insidiosus*, *Chrysoperla rufilabris*, *Ambelysius cucumeris*, *A. swirskii*, and *Hypoaspis miles* tested to determine if they feed on *S. dorsalis* (Ciomperlik, TX). Four molecular assays have been designed for the detection of *S. dorsalis* DNA, and these include two conventional PCR assays and two real-time PCR assays using Sybr green and probes. Potential predators of *S. dorsalis* (*A. cucumeris*, *A. swirskii*, *O. insidiosus*, *H. miles*, and *C. rufilabris*) have been screened with these 4 assays in order to determine the possibility of detecting *S. dorsalis* DNA from their guts. It has been determined that the real-time PCR assays are more sensitive at detecting *S. dorsalis* DNA from the following three predators: *A. cucumeris*, *A. swirskii*, and *O. insidiosus*. We are continuing to test a range of variables which include time exposure between predator and prey and various group extractions.
 - b. Florida (Arthurs, McKenzie, Osborne and Seal)
 - i. We have demonstrated that *A. swirskii* is an effective predator of this pest under greenhouse conditions. We have managed this pest using sachets on roses and releasing 1 predatory mite per pepper or basil plant weekly for three weeks. The level of control would be commercially acceptable. We have also found that this predator will also give acceptable control of *Bemisia tabaci* and broad mite on these three plants.
 - ii. Results of releasing this predatory mite in established landscapes have been totally unacceptable. Thrips populations increased and we could not recover *A. swirskii* after release.
 - iii. Studies conducted by Drs. Arthurs and Osborne on potted pepper plants both in greenhouses and outdoors have been very promising. *A. swirskii* was superior to *A. cucumeris* and controlled established chili thrips populations for > 1 month.. In two other experiments comparing *A. cucumeris* and *A. swirskii* we ran into significant problems. The commercial shipments contained no viable

- predatory mites only grain mites. New studies are underway with predators from a different commercial source.
- iv. We are currently working on developing a mass rearing system for *Franklinothrips vespiformis*. This predator and Orius sp. continually invade our plots and our greenhouse Chilli thrips rearing systems. We spray or thrips host plants with bifenthrin (Talstar) on a regular basis to kill these 2 predators and maintain a viable Chilli thrips colony.
 - v. We have tested the following materials for their impact on *A. swirskii*:
 1. Spirotetramat (Kontos) drench
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 3. Spiromesifen (Judo, Forbid) spray
 4. Etoxazole (Tetrasan) spray
 5. Imidacloprid (Marathon II) spray
 6. Dinotefuran (Safari) spray
(Data Being Summarized)
 - vi. Genetic analysis and identification of predatory mites (McKenzie, Shatters and Osborne). In progress.

On-going research:

- I. Fungal pathogen testing:
 - a. *Beauveria bassiana*
 - b. *Isaria fumosorosea* (*Paecilomyces fumosoroseus*)
 - c. *Metarhizium anisopliae*
 - d. *Lecanicillium muscarium*
- II. Developing rearing systems for various natural enemies.
- III. Testing the impact of pesticides on potentially useful natural enemies.