



## Rugose Spiraling Whitefly, a Sticky Situation in the Florida Keys

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**In the Florida Keys, the Rugose Spiraling Whitefly, *Aleurodicus rugioperculatus*, has become a “sticky” situation that is frustrating homeowners, landscapers, businesses, and governmental officials. The Monroe County Extension Agent has applied a variety of educational and control methods for dealing with this new insect pest. Educational approaches have followed both traditional Extension methods, such as: speaking on the radio, doing newspaper interviews, disseminating information through the internet, educating and utilizing the Master Gardeners, conducting site visits and holding workshop presentations Keyswide. Some non-traditional approaches have included presentations at City and County Commission meetings; developing an evaluation control method tip sheet for people to use to determine how effective or ineffective their control treatments are; and advising local college and high school students in developing a whitefly presentation and tri-folder brochure for use at the Key West Botanical Garden. Control methods also being developed or tested by the Agent include an experiment using aerated vermicompost tea as a root drench or as a foliar spray to determine its effectiveness in controlling the Rugose Spiraling Whitefly; and rearing and releasing the beneficial wasp, *Encarsia guadalupae*, and predatory beetle, *Nepasphis oculata*, along public right-of-ways and public parks.**

Rugose Spiraling Whitefly, *Aleurodicus rugioperculatus*, is a new exotic whitefly species thought to have come from Central America. The first U.S. collection of this whitefly was in the spring of 2009 in Miami–Dade County on a Gumbo Limbo, *Bursera simaruba*. In 2010 and 2011, the whitefly spread throughout Monroe, Broward, and Palm Beach counties. In the fall of 2011, the Rugose Spiraling Whitefly entered into Lee and Collier counties (personal communication). There are additional records from Indian River and Polk counties, indicating that it may be able to survive in Central Florida (Stocks et al., 2012). In the fall 2010, the Florida Keys (Monroe County), the whitefly became known in two locations: Key West and Islamorada (Venetian Shores, mile marker 86). In the spring 2011, the whitefly spread to Marathon. In 2012, it has spread throughout the rest of the Florida Keys.

The Rugose Spiraling Whitefly female lays eggs in a concentric spiraling or circular pattern and covers them with white wax (Stocks et al., 2012). The crawler stage hatches from the eggs and moves around before it starts to feed with its “needle-like” mouthparts. The crawler will molt and go through several immature stages that are oval and initially flat, then more convex, with some of the immature stages secreting long white wax filaments (Mannion, 2010).

As of May 2012, the Florida Department of Agriculture and Consumer Services, Division of Plant Industry has documented that the Rugose Spiraling Whitefly is feeding on 96 host plant species (Stocks, 2012). These host plants are a combination of native, invasive and ornamental plants, edible plants, palms and less common plants.

The Rugose Spiraling Whitefly is considered a nuisance by homeowners, landscapers, and governmental officials. During

the summer of 2011, adult whitefly populations increased to such high numbers that they were seen flying in clouds during the morning or evenings (personal communication), and insect bodies and honeydew dripped into swimming pools, clogging filtration systems and changing the pools’ pH. Also, these exotic whiteflies produce copious amounts of honeydew that become covered with a thick layer of sooty mold. The sooty mold stresses the plants and they start dropping leaves covered with the waxy snow-like material, which covers whatever is beneath them.

### Educational Methods

Traditional educational methods to get the word out about the Rugose Spiraling Whitefly and its control included local radio stations; site visits to homes, businesses, hotels, governmental, and condominium properties; and regional whitefly workshops for homeowners and landscapers.

But the Horticulture Extension Agent tweaked the traditional educational methods by using the Monroe County Extension website, regional Master Gardener trainings, and a whitefly panel workshop. The Monroe County Extension support staff continually updated the website about regional workshops, the latest University of Florida/IFAS Rugose Spiraling Whitefly factsheets, and included the whitefly PowerPoint (in .pdf format). Two regional Master Gardener training sessions were held in Marathon. In summer 2011, Master Gardeners were trained to identify the whitefly life stages, and by spring 2012, they could use their knowledge to help people identify whiteflies and beneficial insects. Educated Master Gardeners help their island community friends and neighbors not only in proper whitefly identification but also in evaluating applied control measures. In Key West, an advertised public whitefly panel discussion was held with the cooperation of the Key West Urban Forester, two local

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landscapers, and a pest control operator. A large and vocal crowd clearly wanted quick solutions for controlling or eliminating the Rugose Spiraling Whitefly.

Non-traditional whitefly educational methods included City and County Commission meetings, an intern program advisor effort and Agent education on data collection methods. Due to the high number of phone calls to local government officials the Agent was invited to give whitefly identification and control presentations at four city and county Commission meetings (Key West, Marathon Layton, and Monroe County). As an advisor for the Key West Botanical Garden, University of Central Florida, and Key West high school intern program, the Agent and two Master Gardeners were able to mentor students in Rugose Spiraling Whitefly identification and its control. With this information the students created a pamphlet and a PowerPoint presentation for educating the garden visitors. The Agent also received hands-on experience by touring three Key West whitefly sites with the UF/IFAS Tropical Research and Education Center research team during their quarterly visits to the Florida Keys to collect Gumbo Limbo samples (10 sets of five leaflets, per tree sample); for evaluation back in their lab on the mainland.

### Control Methods

Traditional controls are based on using integrated pest management methods: physical, cultural, biological and chemical. The physical method focuses on using strong streams of water to dislodge eggs, immature whiteflies and adults, to lower the insect population. Cultural control uses practices that change the environment to reduce or prevent pests from being a problem: right plant, right place, using insect-pest free plants, applying the appropriate amount of fertilizer and water. Specific biological controls for Rugose Spiraling Whitefly are the parasitoids *Encarsia guadalupae* and *Aleuroctonus* sp., and predators *Nepasphis oculata*

and lacewings (brown and green). Chemical recommendations are divided into least toxic contact sprays – horticultural oils and insecticidal soaps; and stronger insecticides – foliar (pyrethroids) and systemics (neonicotinoids).

The Agent has experimented with two non-traditional control methods: a vermicompost tea experiment and the rearing and release of parasitoids and predators. The first experimental control involved making a 24-h aerated vermicompost tea applied in two different experiments: first, as a preventative (before whiteflies arrive), and second, after a plant was infested (after whiteflies have landed). Fifteen coconut palms were used in each experiment. In the preventative and infested experiments the palms were grouped into three treatment types: control (five palms), foliar spray application (five palms) and a systemic drench (five palms). These experiments had no effect whatsoever in slowing the increase of eggs, immature and adult whiteflies. After three weeks both experiments were ended. Hopefully, the long term control of the Rugose Spiraling Whitefly will be improved by increased numbers of the two identified beneficial insects: *Encarsia guadalupae* and *Nepasphis oculata*. At this time these insects are not available commercially, nor is the state rearing them in a biocontrol program. The Agent tried rearing them in an insect rearing cage, but to no success. The agent has noted in locations where the whitefly has been present over a year, they are increasing in numbers. In 2012, the Agent will continue to monitor and evaluate the whitefly and beneficial populations.

### Literature Cited

- Mannion, C. 2010. Rugose Spiraling Whitefly. Aug. 2010. <<http://trec.ifas.ufl.edu/mannion/pdfs/Rugose%20spiraling%20whitefly.pdf>>.
- Stocks, I.C. and G. Hodges. 2012. Pest alert, the Rugose Spiraling Whitefly, *Aleurodicus rugioperculatus* Martin, a new exotic whitefly in South Florida. Feb. 2012. <<http://www.freshfromflorida.com/pi/pest-alerts/pdf/aleurodicus-rugioperculatus-pest-alert.pdf>>.