



Rugose Spiraling Whitefly (RSW): An Invasive Pest Threatening Coconut and Multiple Crops, and its Integrated Management Approaches

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Origin: The highly polyphagous invasive pest, rugose spiraling whitefly (RSW), *Aleurodicus rugioperculatus* Martin, was first identified in Miami-Dade County, Florida, in March 2009 (Stocks and Hodges, 2012). In India, it was initially observed on coconut in Pollachi, Tamil Nadu, in 2016 by scientists from ICAR-NBAIR, Bengaluru. The pest rapidly spread across the coconut-growing regions of South India. It was also found feeding on banana and various ornamental plants. More recently, its presence has been reported in Goa, Assam, West Bengal, Maharashtra, and Gujarat.

Scientific Name: *Aleurodicus rugioperculatus*

Family: Aleyrodidae

Order: Hemiptera

Host range: Coconut, banana, Heliconia, Guava, Henna, Mango, Arecanut and Oilpalm, sapota, maize, oil palm, mango, cashew, cotton

Biology:

Egg: Females lay eggs on the underside of leaves in a concentric circular or spiral pattern and cover it with white waxy matter. The eggs have a short pedicel or subterminal stalk, which is inserted into the host plant during oviposition (Waterhouse and Norris, 1989). a short pedicel or subterminal stalk,

Nymph: The nymphs are light to golden yellow in color, and will produce a dense, cottony wax as well as long, thin waxy filaments (Stocks and Hodges 2012) which get denser over time. The puparium of this species is used for taxonomic identification.

Adults: Rugose spiralling whitefly adults are about three times larger (approx. 2.5 mm) than the commonly found whiteflies and a pair of irregular light brown bands across the wings (Stocks and Hodges 2012). Male of rugose spiraling whitefly, is with pincer like structures at the end of their abdomen.

Weather factors: Below mentioned weather parameters are favorable for the multiplication of the pest

- ❖ deficit monsoon
- ❖ Increase in temperature over 2⁰ C during summer

Nature and symptoms of Damage

- ❖ Both the nymphs and adults of the whitefly suck the sap on the abaxial surfaces of the leaflets.
- ❖ Extensive feeding of the insect leads to the excretion of honey dew which subsequently gets deposited on the adaxial surface of the leaves

- ❖ Honey dew substance, being sweet and watery, attracts ants and encourages growth of the *Capnodium sp.* fungus which causes disfigurement of hosts affecting the photosynthetic efficiency of the plant.

Management

Cultural control:

- ❖ Avoid transplanting of affected coconut seedlings.
- ❖ Follow recommended spacing guidelines.
- ❖ Apply the recommended doses of fertilizers based on soil testing results (soil health card).

Mechanical Control:

- ❖ Coconut leaflets can be dislodged by forced water spray, targeting the lower surface of the leaflets
- ❖ Installation of yellow sticky traps on the palm trunk @ 15 /acre is recommended.
- ❖ Installation of light traps.
- ❖ To dislodge the heavy sooty mould deposition on the leaves of infested plants, starch solution (1%) should be sprayed

Biological Control:

- ❖ Encourage build-up of parasitoid (*Encarsia sp.*) in the orchards and re-introduce parasitized pupae in the whitefly-infested orchards.
- ❖ Predators of RSW such as Chrysoperla and Coccinellids, which are available in the field should be conserved.
- ❖ 1st instar larvae of green lacewing (*Chrysoperla sp./ Mallada sp.*) @ 4000/ acre should be released.
- ❖ *Encarsia guadeloupeae* Viggiani (Hymenoptera: Aphelinidae), an exotic parasitoid of the spiralling whitefly introduced in India in 1999, was found to cause 60–70% parasitism of this whitefly.
- ❖ Spray of entomopathogenic fungus *Isaria fumosorosea* @ 5ml/l of water mixed with detergent/ Khadi soap @ 5g/l can be done at fortnightly intervals to manage the RSW infestation.
- ❖ A Leiochrini beetle, *Leiochrinus nilgirianus* Kaszab 1946 (Tenebrionidae: Coleoptera), along with its immature stages, has been observed feeding on the sooty mold that forms on honeydew secreted by RSW, particularly during the early morning. However, further research on this beetle is necessary.

Botanical:

- ❖ Neem oil (0.5%) should be sprayed in case of severe infestation,
- ❖ The Kerala Department of Agriculture has recommended spraying a mixture of neem oil, soap, and garlic.

Chemical control

- ❖ During heavy infestation - application of Imidacloprid 200SL @ 0.01% or Chlorpyrifos @ 0.04% were found effective against *A. dispersus*

References

1. **Stocks I C, Hodges G. 2012.** The rugose spiraling whitefly, *Aleurodicus rugioperculatus* (Martin), a new exotic whitefly in south Florida (Hemiptera: Aleyrodidae). Florida Department of Agriculture and Consumer Services, Division of Plant Industry. Available from: <http://freshfromflorida.com/aleurodicus-rugioperculatus-pest-alert.pdf>, 2012.
2. **Waterhouse DF, Norris KR, 1989.** Biological control: Pacific prospects: supplement. Canberra, Australia; Australian Centre for International Agricultural Research (ACIAR), vii + 123 pp.22