This brochure was produced by TAME Melaleuca (The Areawide Management Evaluation of *Melaleuca quinquenervia*), a multi-agency project promoting the long-term, areawide management of melaleuca. TAME Melaleuca is funded and coordinated by the USDA's Agricultural Research Service, and cooperators include the South Florida Water Management District and the University of Florida's Institute of Food and Agricultural Sciences. For more information, visit our Web site at http://tame.ifas.ufl.edu.

Lobate Lac Scale and Melaleuca:

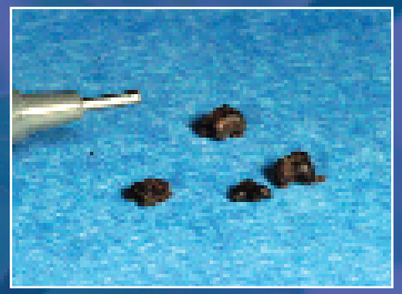
A Devastating Insect Aided by an Invasive Tree

Unintended Consequences and Accidental Introductions

From the end of the last ice age up to the time of Spanish settlement in 1500, the number of species in Florida remained relatively constant. However, when the Spanish arrived, new organisms from disease-causing microbes to feral hogs became established, and over the next 500 years humans continued to introduce new species. Some introductions have been intentional, while others were accidental. Some have had enormous impacts, while others have had none. From house flies and cat fleas to rabies, West Nile virus, house mice, dandelions, melaleuca, and lobate lac scale, hundreds of species have been introduced in the last five centuries. We struggle to maintain fragments of something we call the real Florida, but it is a difficult battle. Melaleuca has overtaken thousand of acres of natural areas, but with an aggressive approach we may win the battle. The lobate lac scale is a different story. This alarming pest is killing trees and shrubs across South Florida, and the effects will ripple across ecosystems and compromise habitat quality for all wildlife. This tiny insect does not discriminate between natural vegetation, landscaped shrubs, or commercial fruit trees. Please help us control lobate lac scale, melaleuca, and all invasive species.

The Invader

Like a hurricane in slow motion, this invader is spreading across south Florida and destroying all kinds of trees and shrubs in its wake. It congregates in large numbers and cloaks itself and its victims in black sooty mold. No larger than a pinhead, this insect has the potential to create big trouble–perhaps the most significant trouble yet for gardeners and natural areas alike in South Florida. It is the lobate lac scale.



Lobate lac scales are small, even next to the lead in a mechanical pencil, yet they lead to death in trees that are highly susceptible to this pest.

The lobate lac scale is a relatively new insect pest in Florida, but it already has an enormous presence. Native to India and Sri Lanka, it was first found in Broward County in 1999 and some of the heaviest infestations remain in this county. By 2002, it had spread north to Lake Worth, south to Homestead, and west into the Everglades. Lobate lac scale also occurs in the Bahamas, where a recent survey found that two-thirds of plant species examined were infested with lobate lac scale.

The lobate lac scale does not discriminate widely in its host plants, and it has been found on over 150 species in Florida. Many important plants are highly susceptible, including native species such as wax myrtle, coco plum, red bay, wild coffee, and strangler fig, and commercially important species such as mango, ficus, lychee, and star-fruit. This widespread choice of hosts is what makes lobate lac scale particularly troubling. Evidence of their sap-sucking destruction includes blackened leaves and branches, branch dieback, and for susceptible species of shrubs and trees, death.

Double Trouble: Melaleuca and the Lobate Lac Scale

Melaleuca (MEL-ah-LUKE-ah) is an invasive weed that spreads into valuable wetlands and other natural areas in Florida. It easily outcompetes native vegetation and severely diminishes wildlife habitat quality. Melaleuca has infested hundreds of thousands of acres and has cost millions in control efforts. It is on the Federal Noxious Weed List and is illegal to possess in Florida. Furthermore, melaleuca serves as a particularly good host for the lobate lac scale. Residential melaleucas infested with the lobate lac scale can act as source populations where large numbers of lac scale larvae are free to spread onto valued landscape and native plants.

Melaleuca and other invasive weeds should be removed in order to protect Florida's natural areas and to avoid or control a lobate lac scale infestation. Contact your county's cooperative extension office for guidance on the removal of melaleuca.

Identification of Lobate Lac Scale

Scientific name: *Paratachardina lobata lobata*

The best known member of the lac scale family (Kerriidae) is the true lac scale of Asia, and while the true lac scale has been used since ancient times to produce shellac, the lobate lac scale has no commercial value. Lobate lac scales are dark brown but often appear dull black due to a covering of sooty mold. This mold also grows on the leaves of infested and nearby uninfested plants, feeding on the excreted sugary waste (honeydew) secreted by the lobate lac scale. Measuring about 2 mm (1/16 inch) across, the adult lobate lac scale is visible to the naked eye, and looks like a tiny, four-lobed bump of bark. These hard-shelled adults are usually surrounded by dozens of other such bumps. They are found primarily on thin woody branches less than 2 cm (1 inch) in diameter.

A combination of bumps on the stems and sooty mold on the leaves of this wax myrtle means a lobate lac scale infestation.

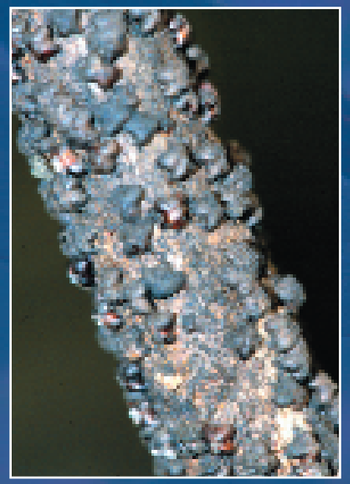
Adults are immobile, but the red-colored larvae are not; it is at this stage of their life cycle that most plants become infested. The larvae, sometimes called crawlers, often crawl or fall to new sites on their host plants or nearby plants. While their spread is often aided by strong winds, much of their long-distance dispersal results from the actions of people, such as when a plant owner moves an infested plant from one location to another. Please help us by not transporting any plants or plant material that you suspect of harboring lobate lac scale.

Wax myrtles are perhaps the most susceptible of all trees to lobate lac scale. Unfortunately, wax myrtles are one of the most important berry-producing trees for birds in South Florida. A blue backdrop was used in this photograph so the damage could more easily be seen.

The Treatment

Because lobate lac scale is a relatively new pest, little research about it has been published. Even so, University of Florida researchers have found that the insecticide imidacloprid is effective in controlling lobate lac scale on ficus trees. Imidacloprid is probably effective on other trees, but it is not currently legal to use on most fruit trees. As with any pesticide application, the applicator must read the label closely and follow the directions. Imidacloprid is widely available and sold under the brand names Merit (for professional applicators) and Bayer Advanced Care Tree and Shrub Insect Control (for homeowners). Horticultural oils are generally effective on scale insects, and work is underway to determine their effectiveness against lobate lac scale.

The best long-term solution for controlling the lobate lac scale is using its natural enemies–a concept known as biological control. When plants or animals are introduced beyond their natural range, they are often without the associated complex of insects and diseases that normally controls their numbers. Biological control involves determining what attacks the pest in its natural range, and then releasing these agents into the newly introduced range. For the lobate lac scale in India, one natural enemy is a tiny nonstinging wasp. The wasp has a very narrow diet and eats only lac scales, but before these natural enemies can be used in Florida, research must confirm that they eat nothing but the lobate lac scale. Researchers with the USDA Agricultural Research Service, the University of Florida, and the Florida Department of Agriculture and Consumer Services (FDACS) are working with colleagues in India and Thailand to acquire and study these natural enemies.



Lobate lac scale usually infests the woody portions of twigs and small branches that are less than 2 cm in diameter (3/4 inch). It has not been observed on foliage.

Nurseries infested with lobate lac scale are quarantined as required by FDACS until they are free of the scale. Residents wishing to treat lobate lac scale infestations may contact their county's extension office (see http://extension.ifas.ufl.edu) for more guidance (including publication #EENY-276). The state has also posted three lobate lac scale circulars online at http://edis.ifas.ufl.edu/IN471, http://creatures.ifas.ufl.edu/orn/scales/lobate_lac.htm, and http://www.doacs.state.fl.us/~pi/enpp/ento/paratachardina.html.