

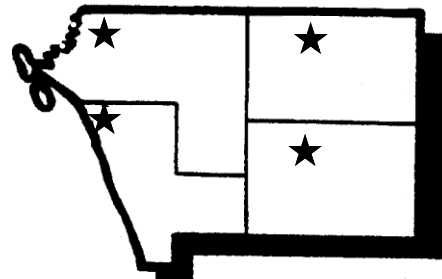
West Central Citrus Letter

DeSoto Extension Service
2150 NE Roan Street
Arcadia FL 34266
863/993-4846

Manatee Extension Service
1303 17th Street West
Palmetto FL 34221
941/722-4524

Hardee Extension Service
507 Civic Center Drive
Wauchula FL 33873
863/773-2164

Sarasota Extension Service
6700 Clark Road
Sarasota FL 34241
941/861-9900



June 27, 2019

Retirement

Dear Friends:

As my retirement rapidly approaches on June 28, 2019, I reflect on the last 34 years serving the great Florida citrus industry with pride and joy. I now need to pause and thank all the people that have helped me along this fantastic and wonderful journey in life. While I would like to name each person that has made an impact or contributed in some way to my success and service, such a list would be impossible to make and would go way beyond what one would read. However, I must thank my parents for giving me the drive and commitment to serve, my wife Debbie and sons, Bill and David, for allowing me to be gone so many days and nights while serving our great citrus industry. Without family support, these activities and service would not have been possible. To them, I must say a great big thanks.

Needless to say, this journey of helping Florida citrus growers and their employees has been personally rewarding and satisfying. I have strived to help our industry meet the many challenges of production, pests, diseases, prices and regulations in a manner that helps the producer and workers while being profitable and environmentally sound.

It is not easy to change roles within the citrus industry, especially when one has worked in it for

the past 45 plus years going way back to the early 1970s (the years in the groves in Pasco County in the 1970s and 80s, to Indian River County in the late 1980s, and finally to my current position in 1990). In the 1990s I began serving the dedicated and committed growers in the Peace River Valley citrus growing area and they have been absolutely amazing. During all these years, I have strived to provide a service and a positive commitment to everyone. What more can I say but thanks to each and every one of those I have worked with or assisted in some way that has made this journey a wonderful ride.

While the journey has not been about or for me, it has been how to serve the people within our citrus industry, impact their lives and serve the public at large, be that growers with thousands of acres or a few, to the homeowner with a single tree in their back yard, or grove workers providing safety and education to improve their knowledge to more safely or effectively do their jobs. Each of these individuals have needs and, hopefully, I have provided a service that has been prompt, valuable and solved their issues or questions. Together, we have tackled issues head-on with field plots, publications that approach 500, assistance with grants, travel, and taking growers to commodity markets in New York and even foreign countries, but most importantly visited you in your groves to

discuss your issues in person. While we have not solved every problem, hopefully, we have made headway to finding solutions or options that have been beneficial and ones that keep the Florida citrus industry profitable.

It has been a great honor and pleasure to serve our Florida citrus industry and those dedicated and hard-working people that make our citrus the signature crop in Florida and one that is admired worldwide. As I leave my current role in the citrus industry, I do so with hope for the future and an abundance of fond memories. The journey for a good old country boy that was raised working in the groves as a youth, driving tractors and semi-trucks hauling fruit to the processing plants, to now helping growers and visiting citrus in many foreign countries, has been beyond anything I would have imagined back in the 1970s. None of this would have been possible without your assistance and support over the many years.

As I end this chapter of my journey in life, it has been an incredible honor and pleasure to say I have worked with so many great individuals while positively impacting their lives. The honor has been mine. Now, I can't thank you enough for allowing me to share time with you while serving to make this a better place and a more productive industry.

If you need Extension assistance in the future, please contact one of the citrus extension agents in the adjoining counties which include: Chris Oswalt (wcoswalt@ufl.edu) in Polk County, Laurie Hurner (lhurner@ufl.edu) in Highlands County and Mongi Zekri (maz@ufl.edu) in Henry County.

Wishing you the best for the future!

Potential New Method to Screen Antimicrobials

Many researchers have been studying new laboratory methods to rapidly screen antimicrobials to improve HLB management. A group being led by Dr. Kranthi Mandadi from Texas A&M is developing a method using hairy root culture as a high-throughput screening method.

To learn more about this potential new method, please see the document at

https://ucanr.edu/sites/scienceforcitrushealth/Research_Snapshots/Mandadi/

USDA Sugar Apple Field Day, July 25, 2019, Ft. Pierce, 10 AM

A sugar apple field day will be held at the USDA Farm, 10001 Picos Road, Ft. Pierce beginning at 10 AM on July 25. Sugar apple (*Annona squamosa*) is a tropical fruit that grows on a small tree and can be grown easily and successfully in south Florida and east and west coast regions of Florida. It may have potential as a small-scale specialty fruit for the local markets. A replicated trial planting of six selections of sugar apple at the USDA farm is 2.5 years old and has a good crop of fruit, typically ripening July-August. Tree care, horticultural performance, cropping, and fruit quality will be discussed. Attendees are invited to examine the trees and fruit. The speaker for the program is Dr. Kim Bowman who is with the USDA, ARS, Ft. Pierce.

Advance registration is requested prior to July 19 by contacting Mongi Zekri at maz@ufl.edu or by phone at 863-674-4092.

Certified Pile Burner, July 24, Southwest Florida Research & Education Center

A certified pile burner class will be conducted at the SWFREC in Immokalee on July 24 from 8:00 AM to 4:30 PM. The class is limited to 50 participants and has a registration fee of \$50 per person.

For more information on the program or to register, please contact Mongi Zekri at maz@ufl.edu.

Dates to Remember:

July 19	Sugar apple field day, Ft. Pierce
July 24	Certified pile burner class, Immokalee

Sincerely,

Stephen H. Futch
Extension Agent, Multi-County
Office: 863-956-8644
Email: shf@ufl.edu

Lebbeck Mealybug

Nipaecoccus viridis (Newstead)

L.M. Diepenbrock and J.D. Burrow



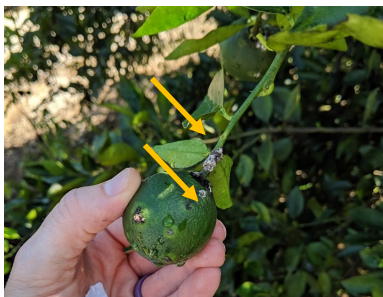
N. viridis crawlers. Photo Credit: T.R. Weeks, UF/IFAS CREC



Ovisac under the microscope. Photo Credit: L.M. Diepenbrock, UF/IFAS CREC



Female without ovisac. Photo Credit: L.M. Diepenbrock, UF/IFAS CREC



N. viridis in the field. Photo Credit: L.M. Diepenbrock, UF/IFAS CREC

Lebbeck Mealybug, *Nipaecoccus viridis*, is an exotic mealybug previously documented on dodder and tallow wood in Palm Beach County and intercepted at ports of entry. In June 2019, it was documented feeding on and damaging citrus in Highlands County, Florida. It is a known pest of citrus in the Middle East, Mediterranean, and Southern African regions. It has a wide range of hosts in Florida including: citrus, mango, pomegranate, grapevine, and several ornamental plants like hibiscus and mulberry.

Life Stages

Mated females will produce hundreds of eggs in her lifetime. These eggs develop into crawlers, which are mobile nymphs (offspring). Nymphs resemble, and are easily confused for, scale nymphs. They are very small, reddish-purple, and have legs and antennae that are visible under magnification.

The adult male is 1.3-2.5 mm long is brown-purple. It has well developed front wings.

The female has three nymphal stages and slowly moves between stages to new feeding sites. The adult is oval, reddish-purple and is 2.4-4 mm long and 1.5-3 mm wide. Once the female begins laying eggs, it develops a white-pale yellow ovisac (egg sack) that houses tiny red eggs and is covered in wax. A female produces approximately 1,000 eggs in her lifetime. In the Middle East, the female is known to live up to 50 days and die shortly after laying all of her eggs.

Spread

Crawlers are very small and can easily be moved on people, animals, farm tools (like pruning shears), farm equipment (trucks, sprayers, tractors), the wind, and are even purposefully moved by ants to new hosts. In other countries, ants have been found farming these mealybugs for their honeydew and serve to protect them from predators.

Scouting

N. viridis prefers to feed on rapidly growing plant material. On fruit, it is most commonly found on the calyx button (area where fruit is attached to stem), but can be anywhere on fruit surface. It prefers new flush and feeds in the axil (angle area between leaf and stem) and branch junctions.



Axil: angle between leaf and stem

1. This document is one of a series of the Entomology and Nematology Department, UF/IFAS Extension. June 2019.

2. Lauren M. Diepenbrock, assistant professor, Department of Entomology and Nematology and Jamie D. Burrow, Extension program manager, UF/IFAS Citrus REC; UF/IFAS Extension, Gainesville, FL 32611. Artwork: T. R. Weeks, UF/IFAS Citrus REC.



Adult female next to ovisac with another female. Photo Credit: T.R. Weeks, UF/IFAS CREC



Leaf damage due to insect feeding. Photo Credit: T.R. Weeks, UF/IFAS CREC



N. viridis on blossom end of fruit. Inset: *N. viridis* on calyx button. Photo Credit: T.R. Weeks, UF/IFAS CREC



Fruit damage from *N. viridis* feeding. Photo Credit: T.R. Weeks, UF/IFAS CREC

Common Misidentification

The *N. viridis* ovisac is commonly mistaken for cottony cushion scale ovisac. They are distinctly different in appearance. *N. viridis* is disorganized, clumpy, and looks dirty; whereas, cottony cushion scale is organized, has long ridges, and is a clean, white color.



Cottony cushion scale life stages. Photo Credit: P.M. Choate, UF

Damage

The damage and feeding sites are distinct from other wax-producing pests (mealybugs and scales), which it has been mistaken for in several fields. *N. viridis* prefers to feed and reproduce on fast growing tissues like new growth, new branches, and fruit. Fruit feeding causes hardened lumps and/or discoloration. Leaves also become twisted/distorted from feeding.

Fruit drop is the biggest factor in crop loss. In South Africa, fruit drop has caused 50% or more crop loss. The fruit damage is distinct and makes the fruit unsightly and unmarketable for fresh fruit markets.

Grove Management

Management for *N. viridis* in Florida is yet to be determined. In its home region, predatory insects (wasps, lady beetles, lacewings) can largely keep populations in check. However, if the populations of predatory beneficial insects are reduced, for example, by broad spectrum insecticides, the lack of predators will allow large populations to build up.

Like all insects that feed within a protected space, adults will be hard to eradicate. Timing for insecticidal actions to crawler activity, much like that done for scale populations, will be key to control.

Human Precautions

Because this pest is easy to move unintentionally, it is highly recommended to sanitize all materials that may have come into contact with them to prevent spread. Power wash large equipment, sanitize smaller tools with a combination of bleach and water before moving to a new grove.

If moving between groves, it is suggested to change clothes and wipe exposed skin surfaces.

References

Plant Pests of the Middle East

http://www.agri.huji.ac.il/mepests/pest/Nipaecoccus_viridis/

Lebeck Mealybug, *Nipaecoccus viridis* (Newstead): An Emerging Pest in Florida Citrus

Where did it originate and where is it now?

Nipaecoccus viridis (Newstead) is native to the Middle East, Mediterranean, and Southern African regions. In November 2009, the insect was found on dodder in Palm Beach County. In June 2019, it was documented feeding on citrus in Highlands County.

The species has a wide range of hosts in Florida including: citrus, mango, pomegranate, grapevine, and several ornamental plants like hibiscus and mulberry.

What does it look like?

N. viridis adult females are small (<4 mm) and oval with spiky wax coverings. When they begin laying eggs, the females develop an extensive, white waxy ovisac (protective egg sack) which contains hundreds of tiny, red eggs smaller than a grain of ground pepper.

The adult males are 1.3-2.5 mm long and are brownish-purple with well developed wings.

Eggs develop into crawlers, which are mobile nymphs (offspring). These nymphs are very small (< 1 mm), reddish-purple. With magnification, the legs and antennae are easily seen.

What type of damage does it cause?

N. viridis prefers to feed and reproduce on fast growing plant parts like new flush, branches, and fruit. The fruit damage is distinct and makes the fruit unsightly and unmarketable. Fruit feeding causes hardened lumps and/or discoloration. Leaves also become twisted/distorted from feeding. In South Africa, fruit drop causes 50% or more crop loss.

**If you think you may have the Lebeck Mealybug, please contact the Florida Division of Plant Industry.
1-800-282-5153**

For more information, please contact Dr. Lauren Diepenbrock,
UF/IFAS Citrus Research and Education Center, Lake Alfred
ldiepenbrock@ufl.edu



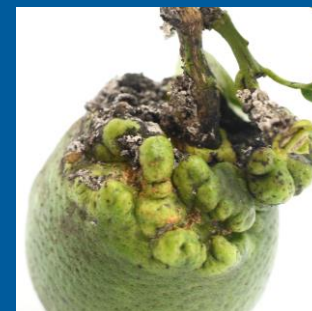
Individual adult female



Female life stages



Leaf damage due to insect feeding



Fruit damage due to insect feeding