

# Searching for Diaprepes Solutions

By Rick Dantzler, CRDF chief operating officer



“The little bastards are worse than greening!” a Highlands County grower wrote me. I guess he could have been speaking of several things, but in this instance, it was diaprepes.

Whether they are worse than greening is debatable, but one thing is sure: A grove with HLB and diaprepes is a very difficult combination to overcome. And it seems to be getting worse. I have received more calls from growers on this in the last few months than in the last three years, so I know it is bad.

The diaprepes root weevil, primarily *Diaprepes abbreviatus*, causes approximately \$75 to \$100 million in citrus production losses annually in the Caribbean region, which includes 22 counties in Florida. [Source: IPM: An Emerging Strategy for Diaprepes in Florida Citrus, Clayton McCoy and Larry Duncan, University of Florida Institute of Food and Agricultural Sciences (UF/IFAS)]. And if damage to roots, cambium and leaves from diaprepes were not enough, the resulting wounds left from their feeding allow entry of root rot diseases, exacerbating the harm.

Are there therapies available to growers? Yes. The 2021–2022 edition of the UF/IFAS Citrus Production Guide has numerous recommendations. You will find cultural and pest-control considerations, including an explanation of the experimental success of placing landscape fabric on the soil’s surface to create a physical barrier, which frustrates the ability of the weevil to carry out its life cycle. Obviously, this is easier to do for new plantings where the fabric can be put down ahead of the trees than for groves already planted, especially large, mature trees. This is why I am so excited about the use of select parasitic nematodes — primarily *Steinernema riobrave* — to attack the larval stages of citrus root weevils.

Known as entomopathogenic nematodes (EPNs), hundreds of millions of these parasites are washed into the soil on and around the roots of citrus trees where they seek out weevil larvae. When they find a larva, they enter through its mouth, anus or cuticles and release *Xenorhabdus cabanillasii* bacteria. They then mature and reproduce. When new nematodes hatch, the bacteria become their food source, turning the body of the larva into mush and killing it. When the nematodes go through two or three life cycles and their food is gone, they leave the larva to look for a new victim. This cycle repeats itself until all the larvae have disappeared, interrupting the life cycle of the weevil.

I learned about EPNs by attending a grower meeting sponsored by a company that has several products that work in this manner and by reading numerous UF/IFAS publications. The Citrus Research and Development Foundation is reviewing a proposal from Lauren Diepenbrock and Larry Duncan of UF/IFAS to look at this further and to research other ways of controlling diaprepes. We are even having discussions about introducing genes from *Bacillus thuringiensis* into the citrus rootstock, hoping to create an insecticidal toxin that would make the rootstock resistant to diaprepes. It works against lepidoptera in corn; maybe it will work on diaprepes in citrus.

