virtual grocery stores (100% online delivery services, such as Kroger delivery-only) has remained consistent. According to the OJ Tracker, on average, around 10% of consumers turned to e-commerce for their grocery needs prior to the pandemic. By late summer of 2022, when access to most grocery services had returned to normal operations, an average of 16% of consumers still utilized e-commerce for grocery purchases.

While usage of store pickup services is not as robust as 2020, ordering groceries online for delivery, either from brick-and-mortar stores or virtual (ghost) grocery stores, remains popular. Reaching consumers through these channels to create and sustain awareness of the health and wellness attributes of 100% OJ is crucial for the category.

Research shows that consumers who use internet grocery options were more likely to report noticing food price increases and shift shopping behaviors accordingly. Moreover, these consumers were more than twice as likely to report awareness of 100% OJ, in general or with Florida promotion, when compared to consumers who didn’t use these online channels. With price as a leading barrier to purchase, reinforcing the premium attributes of 100% OJ may be key to preserving the category through this inflationary period.

As we embark on the 2022–23 Florida citrus season, guiding consumers along the full path to purchase to sustain consumer willingness to pay for 100% orange juice, much like the current FDOC marketing campaign does, may well preserve the category for the long-run and maintain a market for the Florida grower in the years to come. The Florida citrus industry continues to provide significant economic contributions to the state of Florida and its local communities. Current efforts by the industry to shore up commercial inventory and improve yields will ensure the long-term viability of the industry.

Marisa L. Zansler is the director of the Economic and Market Research Department at the FDOC in Bartow. Lijun (Angelia) Chen is an assistant professor at the University of Florida Institute of Food and Agricultural Sciences Florida Agricultural Market Research Center in Gainesville.

---

**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 HLH 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 californica 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.

---

*Column sponsored by the Citrus Research and Development Foundation*