



**Figure 1.** The adult citrus leafminer is difficult to detect.



**Figure 2.** Heavy citrus leafminer infestations make leaves look plasticized and shiny. Look closely to see two larvae (yellow squiggles).

## Recent pest concerns in Florida citrus

By Lauren Diepenbrock

**W**hile Asian citrus psyllids (ACP) are an ongoing concern in Florida citrus due to their role in spreading the bacterium associated with citrus greening, they are not the only pest of concern to growers. Citrus leafminer (CLM) and root weevils are two pests that have been raising concerns and adding to the challenge of managing productive citrus groves.

### CITRUS LEAFMINER

CLM (*Phyllocnistis citrella*) adults are very small moths (Figure 1) that are difficult to detect. The damage caused by their offspring can be quite dramatic (Figure 2, above and Figure 3, page 16) and reduce the photosynthetic capabilities of trees while also increasing the risk of citrus canker. 2018 proved to be a challenging year for management of this pest, with damage evident in most groves. At several locations, damage was so extreme that leaves took on a shiny, plasticized appearance (Figure 2).

Because the adult and egg are small and hard to detect, it is hard to know if a grove has CLM until the damage is visible. CLM activity is coordinated with flush cycles, similar to ACP.



**Citrus leafminer**

So management for CLM may be accomplished if managing for ACP is coordinated with flushing.

In the past, natural enemies (like parasitoids) have been able to suppress the CLM population. However, heavy ACP management is likely to unintentionally reduce natural enemy abundance, so growers may not be able to rely on natural enemies.

During the rainy periods of the summer, the openings made by CLM larvae into leaves can provide an entry point for the bacterium that causes citrus canker, leading to greater spread of this disease.

### ROOT WEEVILS

Root weevils continue to be a challenge to manage in groves where they have established. While most calls to the Extension offices focus on Diaprepes weevils, there are several species that we refer to as “citrus root weevils.” These include Diaprepes root weevil (*Diaprepes abbreviatus*), the blue-green citrus root weevils (*Pachnaeus litus* and *Pachnaeus opalus*), the little leaf notcher (*Artipus floridanus*) and the Fuller rose beetle (*Asynonychus godmani*).

Regardless of what species are present in a grove, their life cycles are quite similar. They have three immature stages: egg, larva and pupa. Adult weevils lay eggs on host plants (not just citrus) above ground. Larvae drop from the leaves and enter the soil to feed on roots. The pupae and young



**Figure 3.** An individual leafminer caused this damage. The dark brown line trailing the larva is frass (excrement).



**Figure 4.** Little leaf notcher feeding can damage leaves.

adult stages are underground. Adults emerge from the soil throughout the year.

Timing of emergence varies by species and geographical region. Blue-green root weevils and Fuller rose beetles normally emerge in April and May. Diaprepes adults emerge from the soil in late May to early July. Diaprepes adult abundance on tree canopies parallels adult emergence in May/June, but can be seen again in late August to mid-October. Little leaf notcher has three generations per year in Florida, with adults being most apparent in April through May, July through August, and October through November.



**Diaprepes root weevil**

All adult weevils are attracted to the silhouette of the citrus tree trunk. Little leaf notcher and Fuller rose beetle are flightless and must crawl up the trunk; other species will fly to the canopy.

While adult root weevils do consume leaf tissue (Figure 4), most of the damage is done below ground, on the roots. When larvae feed, they consume root tissue that is important in the uptake of water and nutrients. Feeding damage also enables infection by phytophthora, which can cause severe declines in tree health over short periods of time.

There are several control methods provided in the Florida

Citrus Production Guide, and growers can choose the ones that work best for their needs. One major factor for control, no matter what other management options a grower chooses, is to reduce the potential of infection by phytophthora by opting for resistant rootstocks when possible.

Recommended management practices focus on the control of different life stages. For adult weevils, access to leaves can be reduced through use of foliar sprays. This will reduce the ability to lay eggs, and therefore reduce the number of root weevil larvae. Chemical or physical barriers to the ground may reduce the success of larvae entering the ground when they hatch from eggs laid on the leaves. If larvae are unable to penetrate the ground surface, they are unable to feed on roots.

Additionally, biological control of the underground life stages using nematodes can reduce pest pressure and help protect trees. Use of these control tactics should be timed to coincide with adult emergence and the onset of leaf flushing in the spring and summer. These tactics should reduce root injury and help sustain root health from grove to grove. See the full management recommendations in the 2018–19 Florida Citrus Production Guide to plan weevil control that is specific to your grove's needs. 🍊

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## Get more information at the following websites:

- **About citrus leafminer:** [http://entnemdept.ufl.edu/creatures/citrus/citrus\\_leafminer.htm](http://entnemdept.ufl.edu/creatures/citrus/citrus_leafminer.htm)
- **Citrus leafminer management:** <https://crec.ifas.ufl.edu/extension/pest/PDF/ACP%20and%20Leafminer.pdf>
- **About Diaprepes root weevil:** [https://entomology.ifas.ufl.edu/creatures/citrus/diaprepes\\_root\\_weevil.htm](https://entomology.ifas.ufl.edu/creatures/citrus/diaprepes_root_weevil.htm)
- **Root weevil management:** <https://crec.ifas.ufl.edu/extension/pest/PDF/Root%20Weevils.pdf>