

# CITRUS PEST SPOTLIGHT

## Citrus leafminer

By Lukasz Stelinski

### IDENTIFICATION

Adult citrus leafminers (CLM) are tiny moths smaller than the size of a mosquito. Due to scales on their wings, they are a silvery iridescent color with a black spot on each wingtip. The hind wings and body are whitish in color.

In general, the adults are too small to be noticed in a grove unless their presence is monitored with pheromone traps. Pheromone lures and traps for monitoring CLM are commercially available from ISCA Technologies ([www.iscatech.com](http://www.iscatech.com)) and Alpha Scents Inc. ([www.alphascents.com](http://www.alphascents.com)). These lures are highly effective and catch only CLM adult males.

At peak season under high infestations, thousands of adults can be trapped within two to three days (Fig. 1). Traps can be useful for determin-

ing the presence of CLM infestation and may be useful to some degree in determining if a control program for leafminer that is being implemented is effective. However, these traps pull in male adults from considerable distances, so trap catch may reflect males attracted from beyond the area that is being evaluated. The mining larval stage is much more conspicuous and easy to identify (Fig. 2).

Although leafminers are active in Florida year-round, in general their flight activity will begin to increase dramatically near the end of March and the beginning of April. Peak flight of leafminer adults will be recorded between early June to late July, and the population will begin to decrease again in late September/early October. Populations are generally low during the winter as adults have fewer resources (new flush) upon which to lay eggs. However, during mild winters like this most recent one, it is easy to find leafminer infestation if any off-season flushing occurs.

### DAMAGE

The larvae mine and feed within young leaves, and sometimes shoots, making serpentine mines (Fig. 2) that may cause the leaf to curl. Typically only one CLM larva will mine a leaf on the bottom surface; however, heavy



**Fig. 1.** Catch of citrus leafminer adults on a sticky trap that was baited with a commercial pheromone lure. This represents approximately 3,000 CLM male adults captured over three days during the month of June.

Photo credit: Ian Jackson, UF-IFAS

infestations may result in three or more mines per leaf. The younger flushing foliage is preferred for egg laying and infestation, and only rarely do CLM larvae mine in fruit.

The mines of CLM larvae are filled with a dark central line of excrement, called frass. This distinguishes CLM mining from that of citrus peelminer, which is also present in Florida, although at lower population densities. Peelminer mines do not have this dark central line.

Although heavy infestation of CLM can stunt growth of new foliage, the larger concern with CLM damage is that it opens leaves and renders them more susceptible to infection by citrus canker. Canker infestations will often be associated with leafminer mines, which take longer to heal than incidental mechanical damage. Therefore, preventing leafminer damage will likely help reduce spread of canker infection.

### MANAGEMENT

There are a number of insecticides available for leafminer management, and all of these will also control citrus



**Fig. 2.** Damage caused by feeding citrus leafminer larvae

Photo credit: Michael Rogers, UF-IFAS

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peelminer (examples: Agri-Mek 0.15 EC, Intrepid 2F, Delegate WG). Foliar insecticides will only control the mining larvae and will provide no control of flying CLM adults. Therefore, these should be well-timed with major flushes to get maximum effect.

In general, the earliest time for application is 13 days after general budbreak, and the last useful date for applying a foliar leafminer spray is 31 days after budbreak. Research is ongoing to determine whether pre-flush applications of certain leafminer foliar products may provide additional control; however, it is important to keep in mind that foliar leafminer products act on the mining larvae. So, if they are not timed with the infestation, then more than likely, the spray's full potential will be compromised. If a heavy flush occurs one or two weeks after a foliar spray is made, those new leaves will likely be unprotected.

Insecticide sprays targeting psyllids can have short, lasting effects on populations of adult leafminer, but should not be relied upon for leafminer control because remaining leafminer adults will continue laying eggs on and infesting new flush at a high frequency.

Soil-applied, systemic neonicotinoid insecticides (examples: Admire Pro, Platinum) are a good option for protecting small, non-bearing trees.

These insecticides will offer dual protection against leafminers and psyllids. These should be applied 10 to 14 days before leaf flush occurs because it takes time for the concentration of insecticide to build up in the leaves to appropriate, lethal levels. The duration of control with soil-applied systemic insecticides is often much longer than with foliar sprays, and can provide up to eight weeks of protection.

A pheromone-based mating disruption product called SPLAT-CLM is now commercially available from ISCA Technologies and registered for use in Florida. Due to technological advancement in production of the pheromone active ingredient,

the cost of the SPLAT-CLM product was recently reduced to \$30-40/acre, depending on application rate. Results of tests in 2011 with the SPLAT-CLM product showed very good protection of leaves from leafminer infestation in mature groves for durations of eight weeks or more between applications. This technology acts by preventing leafminer mating, and thus trees are protected from infestation proactively. However, the product only acts on CLM; therefore, neither natural enemies nor psyllids will be affected.

*Lukasz Stelinski is an assistant professor at the University of Florida-IFAS' Citrus Research and Education Center, Lake Alfred.*

## Fun photo

*L-R: Jessy Jones, McKenna Peters and Elizabeth Kefauver with fruit they picked in Jerry Chicone's grove near Winter Garden. The three – school friends of Chicone's granddaughter – were invited to the grove after saying they wanted to learn to pick oranges.*



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