Imperial County Agricultural Briefs

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BEWARE OF LEAFMINERS!

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There are two species of leaf miner that are common pests of vegetables. A leafminer is the larval stage of an insect in the Diptera (fly) family. There is the Vegetable Leafminer: *Liriomyza Sativae* and the American Serpentine leafminer: *Liriomyza trifolii.* (See Table 1 for some characteristics to get aid in leafminer identification.) Leafminer has been a minor pest on bell peppers in the Coachella Valley, but that has started to change. In 2016, several fall bell pepper fields reported higher than normal populations of leafminer. It is one of those pests that is always around because it can feed on up to 78 plant species but is normally kept under control by predatory wasps known as *Diglyphus isaea* and *Dacnusa sibirica.* For biological control, *Diglyphus* works better in the summer and *Dacnusa* works better in the winter.

Table 1. An aid in identifying leaf miner species*

1. Vegetable Leafminer: *Liriomyza Sativae*	2. American Serpentine Leafminer: Lyriiomyza Trifolii
Shiny black on upper surface	More grayish on upper thorax
Area between the eyes yellow, yellow triangle between the bases of the wings	Area behind the eyes is mostly yellow, only a small black portion touching the edge of the eye
Area just behind the eyes black	

*Information from: UCIPM

Leafminer Lifecycle

The adults are small flies with a yellow triangular spot on the thorax. Figure 1. is a typical leafminer life cycle: egg, nymph, pupa and adult. There are three nymph (larval) instars.

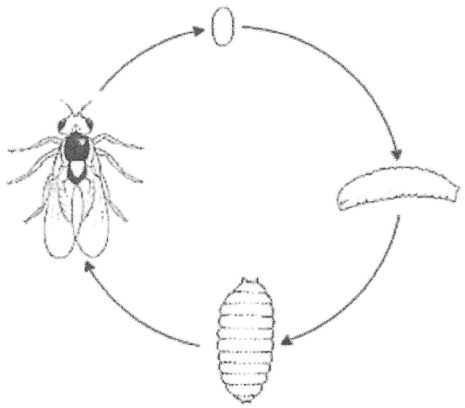

Figure 1. Leafminer Life Cycle

Figure 2 is a picture of an adult leafminer collected in a Coachella Valley bell pepper field; note the yellow spot on the thorax.

Figure 2. Adult leafminer.

The adult female will puncture the leaf tissue for feeding and for ovipositing a white oval egg within the leaf. The larva feeds randomly on the mesophyll between the leaf surfaces, feeding leaves distinct silvery-colored tunnels. See Figure 3. for tunnel feeding symptom on bell pepper leaf. These tunnels/scars are referred to as "Stipples".

Figure 3. Leafminer feeding damage on bell pepper leaf.

As the larva mature, they will create an exit hole and pupate on the leaf or in the soil. There can be many generations of leafminer per year depending on the weather.

Damage

At first the damage is cosmetic to the leaves. But when the leafminer populations build up, the bell pepper plants will drop leaves as in Figure 4.

Figure 4. Bell Pepper plants dropping leaves due to high levels of leaf miner feeding.

Once the plant begins to defoliate, the bell pepper fruit will be exposed to the sun and yields will be significantly reduced due to sunburn.

Management

Avoid early-season applications of broad-spectrum materials. Broad-spectrum insecticides applied against other insect pests also harm the beneficial insects and allow the leafminer population to explode. With the use of insecticides there is also the risk that leafminers will become resistant.

Chemical control for leafminers can be found at the UCIPM web site link shown below. Always check to make sure that the materials are registered for the crop you want to treat. There may also be available newer registered materials that are less harmful on the predators.

References

- Partners with Nature: Koppert B. V. The Netherlands. https://www.koppert.com/pests/leaf-miners/
- UCIPM: Leafminers. http://ipm.ucanr.edu/PMG/r783300911.html