DESCRIPTION OF THE PEST
Liriomyzid leafminer adults are small, shiny, black flies with a bright yellow, triangular spot on the upper thorax. Eggs are white and oval and laid within the leaf. Larvae feed between leaf surfaces, creating meandering tracks or mines. Mature larvae leave the mine and drop to the ground to pupate. The life cycle takes only 2 weeks in warm weather; there can be many generations a year.

DAMAGE
Larvae mine between upper and lower leaf surfaces, creating winding, whitish tunnels that are initially narrow, but then widen as the larvae grow. Leaves injured by leafminers drop prematurely; heavily infested plants may lose most of their leaves.

MANAGEMENT
Regular monitoring for leaf mines is important in detecting damaging populations of this pest. Avoid the use of early season applications of broad-spectrum insecticides (dimethoate, endosulfan, esfenvalerate, methomyl) for control of other pests in order to conserve natural enemies of the leafminer.

Biological Control
Natural enemies, primarily parasitic wasps in the *Diglyphus* genus, often control leafminers. When parasites are killed by pesticides, leafminer outbreaks are common.

Organically Acceptable Methods
Biological control and sprays of azadirachtin and the Entrust formulation of spinosad are acceptable for use on organically certified produce.

Monitoring and Treatment Decisions
Regularly check peppers approaching maturity for leafmines. Most mines occur on older bottom leaves. Some mines are most obvious from the underside of the leaf. If leafminer populations build to high levels, a chemical treatment may be necessary. Avoid early season applications for other insects.

<table>
<thead>
<tr>
<th>Common name</th>
<th>Amount/Acre**</th>
<th>R.E.I.+</th>
<th>P.H.I.+</th>
</tr>
</thead>
<tbody>
<tr>
<td>(trade name)</td>
<td>(hours)</td>
<td>(days)</td>
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When choosing a pesticide, consider information relating to *impact on natural enemies and honey bees* and environmental impact.
### A. ABAMECTIN* (Agri-Mek) 0.15EC
8–16 oz  
MODE OF ACTION GROUP NUMBER*: 6  
COMMENTS: Do not apply at less than 7-day interval. Do not exceed 48 fl oz/acre/growing season. Do not apply in less than 20 gal water/acre. Do not make more than 2 sequential applications.

### B. SPINOSAD (Entrust)#
2–2.5 oz  
MODE OF ACTION GROUP NUMBER#: 5  
COMMENTS: Use higher rate for later instars and heavy infestations. Best control is achieved when aimed at newly hatched larvae and coverage is thorough. More broad-spectrum than Bt but has very low toxicity to humans, vertebrates, and the adults of many natural enemie. Can remain toxic to larval stages (especially syrphid fly) for 5–7 days after treatment. Do not exceed 29 fl oz of Success or 9 oz of Entrust/acre/crop.

### C. CYROMAZINE (Trigard) WP
2.66 oz  
MODE OF ACTION GROUP NUMBER*: 17  
COMMENTS: Do not make more than 2 sequential applications.

### D. AZADIRACHTIN# (Neemix) 4.5
4–7 fl oz  
MODE OF ACTION GROUP NUMBER#: 18B  
COMMENTS: Must be consumed by larvae; kills leafminer after pupation. A regulated product in an organically certified crop.

** See label for dilution rates.  
+ Restricted entry interval (R.E.I.) is the number of hours (unless otherwise noted) from treatment until the treated area can be safely entered without protective clothing. Preharvest interval (P.H.I.) is the number of days from treatment to harvest. In some cases the R.E.I exceeds the P.H.I. The longer of two intervals is the minimum time that must elapse before harvest.  
* Permit required from county agricultural commissioner for purchase or use.  
# Acceptable for use on organically grown produce.

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**PRECAUTIONS**

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**PUBLICATION**

*UC IPM Pest Management Guidelines: Peppers*

UC ANR Publication 3460

Insects and Mites

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