

Biosecurity Advice

ALERT

Pest

Liriomyza huidobrensis (Serpentine leafminer)

Date

17 June 2022

Location

Werribee, Victoria

Situation

Serpentine leafminer (also known as Pea leafminer)

Liriomyza huidobrensis has recently been found infesting a vegetable farm in Werribee (June 2022).

Biosecurity and Agriculture Services, Agriculture Victoria (Ag VIC) will **not** be mounting a response to delimit (undertake surveillance) the current distribution of the pest due to Serpentine leafminer already being present in Queensland and New South Wales (2020).



Serpentine leafminer are flies in the genus *Liriomyza* and can be confused with other species within the genera. Larvae feed internally on plant tissue, particularly the leaf, creating the classic mining trails that are associated with infestation. Larvae then pupate in the substrate beneath the plants and hatch out as flies which then lay eggs on surrounding host plants perpetuating the reproductive cycle and increasing damage. Damaged plants commonly have reduced yield and in some cases are completely destroyed. The pest is known to carry and develop insecticide resistance making it difficult to control. It has a wide host range and can be easily confused with other species of leafminer.

For useful identification information and images please use the on-line pest identification platform www.pestid.com.au

Biology

Liriomyza huidobrensis - Serpentine leafminer is widely distributed across the America's, Asia, Africa, Middle East and Europe with Australia the only remaining continent free of this pest. History has shown that Serpentine leafminer is capable of quickly establishing pesticide resistance through overuse and poor rotation management of effective insecticides.

The life cycle timing is as follows (established in Peru): egg stage (3-4 days); first-instar larva (3-4 days); second-instar larva (2-3 days); third instar (3-4 days); pupal stage (12-18 days). Females had an average longevity of 3 - 28 days: male longevity 2-6 days. The mean number of eggs laid per female in winter was 117 and in spring was 161.

Female flies use their ovipositor to puncture the leaves of the host plants causing wounds which serve as sites for feeding (by both male and female flies) or oviposition. Feeding punctures of Serpentine leafminer are rounded, usually about 0.2 mm in diameter, and appear as white speckles on the upper leaf surface. The appearance of the punctures does not differ between *Liriomyza*

species, nor can the pattern of their distribution on the leaf be used to separate species, which can complicate identification. Feeding punctures cause the destruction of a large number of cells and are clearly visible to the naked eye.

Eggs are inserted just below the leaf surface and hatch in 2-5 days depending on the temperature. The number of eggs laid varies according to temperature and host plant. There are three larval stages, and all feed within the leaf or stem tissue. The larvae predominantly feed on the plant in which the eggs are laid, although some species of *Liriomyza* can exit one leaf and enter another (not reported for Serpentine leafminer). The larvae leave the plant to pupate with pupae found in crop debris, in the soil or sometimes on the leaf surface. Pupariation is adversely affected by high humidity or drought.

Several generations may be produced during the year, with eggs being laid just beneath the surface of the leaf. On hatching, the larvae “mine” the leaf, hence the name leafminer. Damage to the plant is caused in several ways: (i) by the stippling that results from punctures made by females for feeding on sap and laying eggs; (ii) by the internal mining by the larvae; (iii) by allowing pathogenic fungi to enter the leaf through the feeding punctures and (iv) mechanical transmission of plant viruses. This damage results in a depressed level of photosynthesis in the plant. Extensive mining also causes premature leaf drop, which can result in sun scalding of fruit or reduced tuber filling of potatoes.

The larvae of Serpentine leafminer tunnel in the chloroplast-containing spongy mesophyll layers, disrupting photosynthesis. The larvae leave winding trails (mines) as they feed inside leaves and other plant parts. The mines are easily visible and when the larvae are in large numbers this feeding damage can cause substantial economic losses.



Liriomyza huidobrensis (Serpentine leafminer) host list

Botanical Name	Common Name	Botanical Name	Common Name
Primary hosts		Primary hosts	
<i>Allium cepa</i>	onion	<i>Allium sativa</i>	garlic
<i>Apium graveolens</i>	celery	<i>Chrysanthemum x morifolium</i>	florist's chrysanthemum
<i>Cucurbita pepo</i>	ornamental gourd	<i>Lactuca sativa</i>	lettuce
<i>Phaseolus vulgaris</i>	bean		
Secondary hosts			
<i>Amaranthus</i>	grain amaranth	<i>Amaranthus retroflexus</i>	redroot, Prince of Wales
<i>Aster</i>		<i>Beta vulgaris</i>	beetroot
<i>Calendula</i>	marigolds	<i>Capsicum annum</i>	bell pepper
<i>Cucumis melo</i>	melon	<i>Cucumis sativa</i>	cucumber
<i>Datura</i>		<i>Galinsoga</i>	
<i>Gerbera</i>	Barberton's daisy	<i>Gypsophila paniculata</i>	babysbreath
<i>Lathyrus</i>	vetchling	<i>Linum</i>	
<i>Lycopersicon esculentum</i>	tomato	<i>Medicago sativa</i>	lucerne, alfalfa
<i>Melilotus</i>	melilots	<i>Petunia</i>	Petunia
<i>Pisum sativum</i> var. <i>arvense</i>	Austrian winter pea	<i>Solanum melongena</i>	aubergine
<i>Solanum tuberosum</i>	potato	<i>Spinacia oleracea</i>	spinach
<i>Tagetes</i>	marigold	<i>Tropaeolum</i>	nasturtium
<i>Vicia faba</i>	broad bean		
Wild hosts			
<i>Bidens pilosa</i>	spanish needle	<i>Emilia sonchifolia</i>	consumption weed
<i>Galinsoga parviflora</i>	gallant soldier	<i>Portulaca oleracea</i>	pigweed
<i>Sonchus</i>	sowthistle	<i>Oxalis</i>	wood sorrels

Source: Threat Specific Contingency Plan Serpentine leafminer (PHA 2009)

Greenlife Industry Australia (GIA) leafminer resources

- GIA has a number of resources relevant to leafminer here: <https://nurseryproductionfms.com.au/vegetable-leafminer/>
- Pest identification here: <https://pestid.com.au/>
- Pesticide information here: <https://nurseryproductionfms.com.au/apps-mup-search/>

For further information, please email: john.mcdonald@greenlifeindustry.com.au

 <p>Hort Innovation Strategic levy investment</p>	 <p>NURSERY FUND</p>	<p>This project has been funded by Hort Innovation using the nursery research and development levy and funds from the Australian Government. For more information on the fund and strategic levy investment visit horticulture.com.au</p>
---	--	--