

**CITRUS LEAFMINER**

*Phyllocnistis citrella* Stainton

**1 PEST PROFILE**

**1.1 Distribution and status**

Citrus leafminer occurs mainly during summer and autumn in all citrus-producing areas. It is of primary importance for non-bearing trees as it damages new foliage.

**1.2 Description**

The adult moth is active at dusk and therefore seldom seen during the day. It has a wingspan of 4 mm. The translucent eggs are usually laid singly against the midrib of young leaves. On hatching, the first instar larva immediately burrows beneath the leaf cuticle. As feeding continues, the larva traverses the leaf in a characteristic serpentine fashion leaving behind a translucent tunnel (mine) between the upper and lower leaf surfaces. Frass excreted by the larva forms a central dark line in the mine. The third instar larva usually makes its way to the edge of the leaf where it spins its cocoon, curling the leaf edge in the process for protection, and pupates. In hot summer conditions the life cycle can be as short as 13 days.

**1.3 Infestation site on tree**

Eggs are usually laid singly near the midrib on the underside of young, unhardened leaves. Where infestation is severe, eggs may be laid on the upper surface of the leaf, on newly emerged shoot tips and, occasionally, on a fruitlet.

**1.4 Damage**

**1.4.1 Symptoms**

Foliar damage is caused by the feeding activity of the larvae. Newly emerged growth flush is the primary target. Once the leaves have hardened they are no longer susceptible to attack. Serpentine mines are visible within the leaves which may later curl at the margins and become yellow or brown. The larva pupates within a cocoon spun at the leaf margin which is folded over to give protection. Mines are occasionally found in green twigs but very seldom in fruit.

**1.4.2 Seasonal occurrence**

Citrus leafminer damage is most noticeable on the summer and autumn growth flushes.

**2 MANAGEMENT ASPECTS**

**2.1 Infestation / Damage assessment**

**2.1.1 Inspection**

New growth on young trees should be inspected weekly for the presence of leafminer symptoms.

**2.1.2 Treatment threshold**

There are no formal infestation criteria on which to base treatment. In Florida, USA, it is suggested that if more than 10% of the new leaves are infested with live leafminer larvae some form of treatment may be indicated. No treatment is considered necessary for bearing trees.

**2.2 Control Options**

**2.2.1 Biological**

A number of hymenopteran parasitoids have been bred out from citrus leafminer larvae and pupae. *Citrostichus phyllocnistoides* (Narayanan) is an indigenous primary leafminer parasitoid and *Ageniaspis citricola* Logvinovskaya has been imported and released. Other parasitoids which have been observed are: *Notanisomorphella borborica* (Giard), *Cirrospilus longifasciatus* Ferrière, *Sympiesis striatipes* Ashmead, *Cirrospilus cinctiventris* Ferrière, and *Platocharis coffeae* (Ferrière). The last two are known parasitoids of the coffee leafminer. The natural enemy complex can make a significant contribution to control especially late in the season. However, earlier season infestations are not well controlled biologically.

**2.2.2 Cultural**

There are no cultural options that can be used to suppress or control citrus leafminer on young trees.

**2.2.3 Plant protection products**

The systemic chloronicotinyls, imidacloprid and acetamiprid, are among the few treatments that are registered for the control of citrus leafminer in South Africa as follows:

Product	Dosage
imidacloprid 350 SC Nursery trees Non-bearing trees	1.5 ml / seedling in 200 ml water as a drench 8 ml/tree in 1 l water around base of trunk
acetamiprid 222 SL	2 ml / m <sup>2</sup> canopy surface applied undiluted to the stem
abamectin SC 84 g/l	2.2 – 4.3 ml + 300 ml light or medium grade narrow distillation mineral spray oil per 100 litres of water spray mixture

Experience has shown that imidacloprid applied against red scale on bearing trees will control any leafminer present on the first two flushes of the growing season. Abamectin, when applied as registered for citrus thrips control, will also protect newly emerging flush if leafminer is present at the time of spraying. Control in Israel relies on the use of soil-applied imidacloprid and stem applications of acetamiprid. In Australia it has been demonstrated that sprays of narrow range oil at 0.5% will prevent leafminer moths from laying eggs for a number of days.