CITRUS LEAFMINER

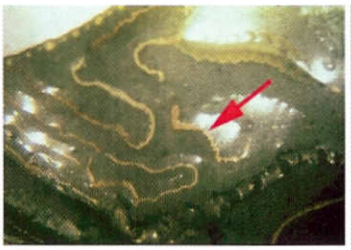
PHYLLOCNISTIS CITRELLA

adult leafminer actual size

Situation: Primarily an Asian pest, citrus leafminers were first discovered in Florida in 1993. These moths rapidly became a significant problem, with infestation rates of up to 90% of orchards in some areas in Florida in the year of introduction. By 1995, the citrus leafminer was discovered in Texas, Central America, western Mexico, and several Caribbean islands. The leafminer has been found in the Imperial Valley and across the border in Mexicali, Mexico.

Damage: Larvae of citrus leafminer form serpentine mines in leaves and fruit of citrus. Grapefruit, lemon and lime are most susceptible to damage but the leafminer attacks all varieties, as well as over 20 different plants belonging to the citrus family Rutaceae. Mines are characteristized by a central line of frass (red arrow in figure below), which can be used to separate them from mines of the native peelminer. The citrus leafminer only infests young flushing foliage and lays its eggs on upper and lower surfaces of leaves less than half an inch in length. Pupation occurs in folds on the edges of leaves. Citrus leafminer rarely attacks fruit. Leafminers have a short developmental time and as many as 6-13 generations per year can be expected depending on foliage flushing cycles and temperature. Infestation levels of 1-3 mines per leaf occur in Australia. In Florida, which has a much wetter climate, infestations of 15-20 miners per leaf are common.

leafminer eggs



leafmine with frass lines

leafminer larvae

leafminer pupa

Economic Impact: Economic losses due to the citrus leafminer include 1) increased costs for protecting nursery trees and young non-bearing citrus, 2) reduced sales to home gardeners, and 3) increased orchard production costs, either directly, through the use of pesticides (largely ineffective), or indirectly, through treatments that disrupt biological control and Integrated Pest Management programs. Except on limes, the loss of yield on mature trees because of foliage damage has not been demonstrated.

Distribution: Citrus leafminer was relatively unknown until the mid-1970's, when in Australia, it was first noticed as a pest. It was first described in 1856 and first reported from Australia in 1918 and South Africa as early as 1908. Since it has achieved pest status, its range has rapidly expanded worldwide to include the Mediterranean, Africa, Central America and the United States.

wilting after severe damage

Control: Enhancement of natural enemies, especially parasitic wasps, is considered the most effective means of managing infestations of the citrus leafminer on older fruit bearing citrus. Two poly-embryonic parasitoids are considered to have potential for effective control. 1) The encyrtid wasp, *Ageniaspis citricola*, is a specific parasite and will be imported. In the pupal stage, the wasp forms a chain of 2-7 brown cocoons. 2) The native eulophid wasp, *Cirrospilus coachellae*, which attacks the citrus peelminer, is expected to shift to the leafminer. This parasite forms a series of 2-7 naked black pupae in the mine. Other species of native eulophid wasps also are expected to shift to the leafminer as populations increase.

Ageniaspis pupae

Reporting Infestations: If you suspect that you have a citrus leafminer infestation, please contact your local Farm Advisor or County Agricultural Commissioner's Office as soon as possible.

Prepared by the Citrus Research Board, California Department of Food and Agriculture and the University of California Center for Exotic Pest Research. Photographs courtesy of Harold Browning and the University of Florida.