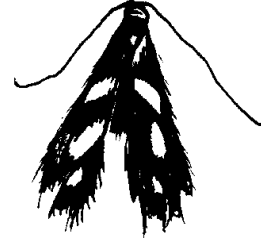


## LEAFMINERS *Lepidoptera: Gracilariidae* Western Tentiform Leafminer *Phyllonorycter elmaella*, and *Phyllonorycter* spp.

### DESCRIPTION

**Adults** are small (6 mm long), golden brown moths with white bands or spots that give them a silvery appearance when they fly in sunlight. The hind wings are gray with long hairs on the margins. When at rest, the wings are held rooflike over the body. The first three **larval stages** are collectively called sap-feeders. During this time, they are legless, flat, and white with a wedge-shaped brown head. They have sucking mouthparts that protrude forward. Fourth and fifth stage larvae are tissue feeding and have chewing mouthparts. These stages have a round head and legs and prolegs.



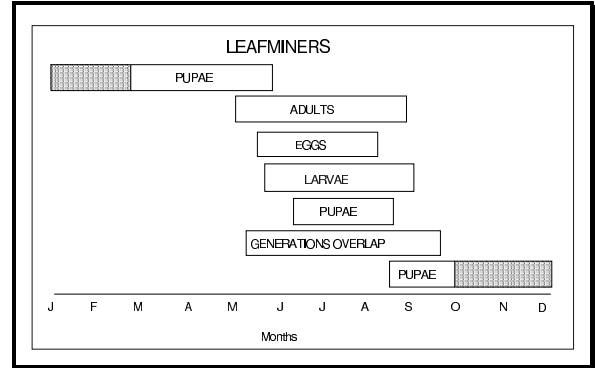
Western Tentiform Leafminer Adult

### ECONOMIC IMPORTANCE

Larvae feed on cells between upper and lower epidermal layers on foliage of apple, cherry, and pear causing direct injury to leaves which also influences fruit quality by interfering with sugar development. An accumulation of five to seven miners per leaf over the entire season may have little effect on fruit production. However, greater mine density adversely affects growth and a mine density of 20 per leaf causes a 25% reduction in net photosynthesis and may cause defoliation and premature fruit fall.

### DISTRIBUTION AND LIFE HISTORY

Three species of leafminers occur in North America: the **spotted leafminer**, *Phyllonorycter blancardella*; the **apple blotch leafminer**, *P. crataegella*; and the **western tentiform leafminer**, *P. elmaella*. These species overwinter on the ground as pupae inside mines in fallen leaves. Adults emerge and begin laying eggs when the first leaves are unfolding in pears and in apples from tight cluster through petal fall. Eggs are laid singly on lower leaf surfaces. Eggs hatch in one to two weeks and larvae begin mining between the upper and lower leaf epidermis. Stage one through stage three larvae feed within the leaf for two to three weeks and fourth and fifth stage larvae feed on leaf tissue for about two weeks. Tissue-feeding larvae tie the sides of the mine together with silk, giving the mines a tentlike appearance. Pupation takes place within the mine and lasts from seven to 10 days. Adults emerge in mid-June and lay eggs as before to begin another generation. There are three and possible a partial fourth generation each year.



### MANAGEMENT AND CONTROL

Outbreaks occur infrequently in the northwest and the trend has been for populations to increase dramatically over a few years and then crash. Naturally occurring parasites may help suppress populations and could contribute to cyclic outbreaks. Sampling to determine the need for control is done in late May and early June by checking 100 leaves for mines. If there are two to three mines per leaf and no parasites, an application of an insecticide may be justified. No treatment may be necessary if 40% or more of the larvae are parasitized. The level of parasitism in the first generation may be a good indicator of potential parasitism in later generations (30 to 40% parasitism in the first generation may be adequate to control leafminers in later generations). Pheromone traps may be used to monitor emergence of males from the first generation, which will provide an indication of the population and the likely severity of subsequent generations.