Tree Fruit IPM **1980**
Insect Identification Sheet No. 9

spotted tentiform leafminer

Phyllonorycter (=*Lithocolletis*) *blancardella* Fabricius
P. crataegella Clemens
P. malimalifoliella Braun
P. sorbi Frey
P. mespilella Huber

INTRODUCTION

Spotted tentiform leafminer (STLM) was first used to name *P. blancardella* but has been ascribed to and describes the injury to apple leaves caused by all five species. *P. blancardella*, of European origin, and the two native species, *P. crataegella* and *P. malimalifoliella*, are found in the eastern United States and Canada. *P. blancardella* has a more northerly range while the native species are more common further south. *P. sorbi* and *P. mespilella* are European species that have been introduced into Oregon and California, respectively.

The STLM has three generations a year in most areas. The first develops on apple leaves from tight cluster through 2-3 weeks after bloom. The second generation develops during mid-sumnmer (late June to early August). The third generation develops from late August until leaf drop.

THE ADULTS

STLM adults are slender, brown moths with distinct silver to cream colored markings on the upper wings (Fig. 1). Their length (2.3-3.8 mm) varies between species and generations. The moths that emerge in the early spring from overwintering pupae tend to be larger and darker than adults of the other two generations.

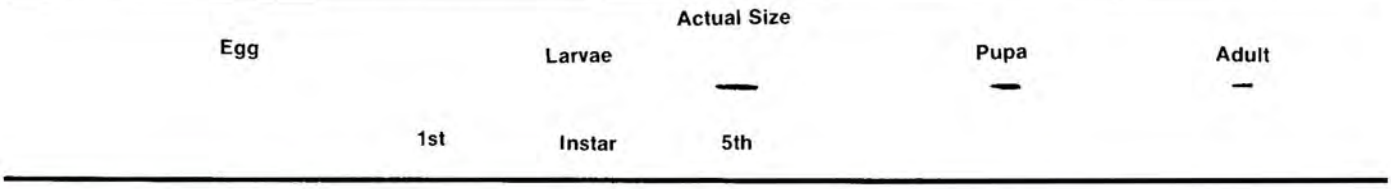
Adults begin emerging from overwintering pupae at the half-inch green or tight cluster stage of McIntosh bud development. Mating and egg laying occur in the evening. A female will lay an average of 25 eggs.

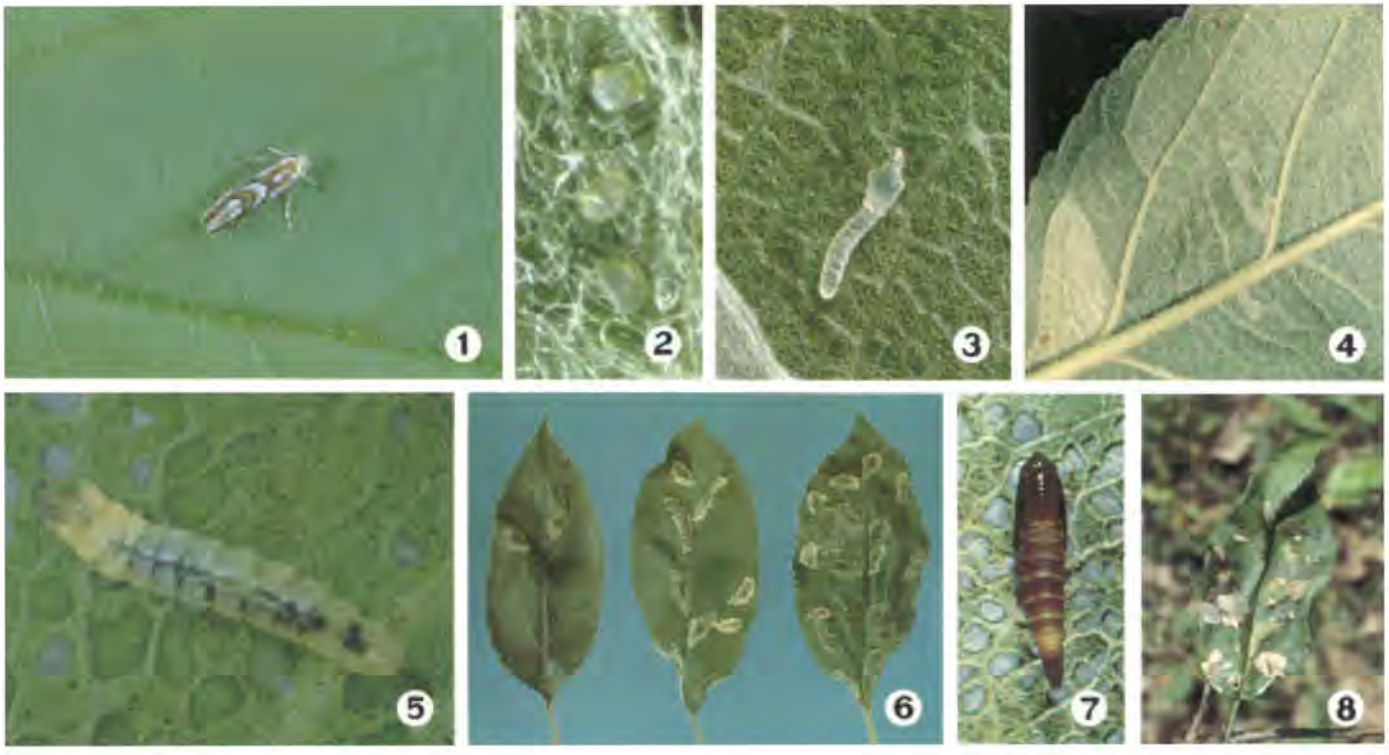
THE EGGS

STLM eggs are small (0.3 mm in diameter), elliptical, and creamy to transparent in color (Fig. 2). The eggs are laid on the undersides of leaves and, depending on temperature, hatch in 5-16 days.

THE LARVAE

STLM larvae have five instars. The first three instars are referred to as the "sap feeding stage" because they feed on the sap from the spongy mesophyll of the leaves (Fig. 3). In the process of feeding, they separate the outer layer of the leaf undersurface from the tissue above and the mines are only visible from the under leaf surface (Fig. 4). The fourth and fifth instars feed more on the leaf tissues and are referred to as the "tissue feeding stage" (Fig. 5). Their feeding gives the mines a tent-like appearance with visible





spots where the green tissue has been removed (Fig. 6).

When full grown, the larvae are about 4 mm long, cylindrical, and white to pale green in color. Prior to pupation, the larvae turn yellow. Larval development takes about 24 days to complete for the first and second generations and considerably longer for the third.

THE PUPAE

STLM pupae are 3-4 mm long and change in color from yellow, when first formed, to dark brown (Fig. 7). The pupal period lasts about 1.5 weeks for the first two generations and extends through the winter for the third generation. Prior to emergence as an adult, the pupa cuts through and partially protrudes from the lower leaf surface of the mine. The pupal skin remains attached to the leaf after the adult has emerged.

INJURY

STLM injury, due to feeding within the mines, reduces the photosynthetic capability of the leaves and disrupts the growth regulating and ripening processes governed by hormones produced in the leaves. Severe STLM infestations may cause leaf drop, premature ripening and fruit drop. Injury from mining may also sensitize the leaf tissues, making them more susceptible to spray injury (Fig. 8).

CONTROL

Several parasites and predators attack the STLM. Spray programs against the STLM and other pests, however, reduce or eliminate the control of the beneficial species in commercial orchards.

Chemical control of the STLM is recommended for the first and second generations. Injury from the third generation develops on most apple varieties too late in the season to be a serious problem. Also, omission of pesticide use against the third generation encourages the establishment of natural enemies.

Consult your local recommendations for the best materials and spray timings for your area.

GUIDE TO STAGES

STAGE	TIMING	WHERE TO LOOK
Adults		
1st flight	1/2 green through fruit set	On ground, trunk, branches, and developing foliage
2nd, 3rd flight	Late June through mid-September	Same as above
Eggs	Tight cluster through September	Underside of leaves
Larvae		
1st brood	Bloom through June	In mines in leaves on tree
2nd, 3rd brood	July through October	Same as above
Pupae		
1st brood	Mid-June to July	Same as above
2nd brood	Late July to August	Same as above
3rd brood (overwintering)	September to following spring	Same as above and in mines in overwintering leaves on ground

Published by the New York State Agricultural Experiment Station, Geneva, A Division of the New York State College of Agriculture and Life Sciences, A Statutory College of the State University, Cornell University, Ithaca. Authored by R. W. Weirs and D. Ophardt.