

period. They then begin laying egg masses which gradually diminish in size with each succeeding egg mass laid. A female is capable of laying up to 900 eggs during her 7-8 day oviposition period.

obliquebanded leafroller

Choristoneura rosaceana (Harris)

INTRODUCTION

The obliquebanded leafroller (OBLR) is native to and widely distributed throughout temperate North America. Larvae feed on a wide range of plants; members of the rose family are their preferred hosts. OBLR outbreaks have resulted in severe damage to apple, peach, and pear fruit. The OBLR may have 1-2 generations a year, depending on the locality.

THE ADULTS

The spring flight of OBLR adults begins about 3-4 weeks after petal fall on apples, and continues for 3-4 weeks. In areas where the OBLR has 2 generations, a second flight occurs from early August through early September.

OBLR adults are 9-12 mm in length and have a wingspan of 20-27 mm. The forewings are reddish-brown and crossed by 3 oblique chocolate brown bands (Fig. 1). The hind wings, which are not visible when the moth is at rest, are pale yellow.

After emergence, females have a 24 hr preoviposition

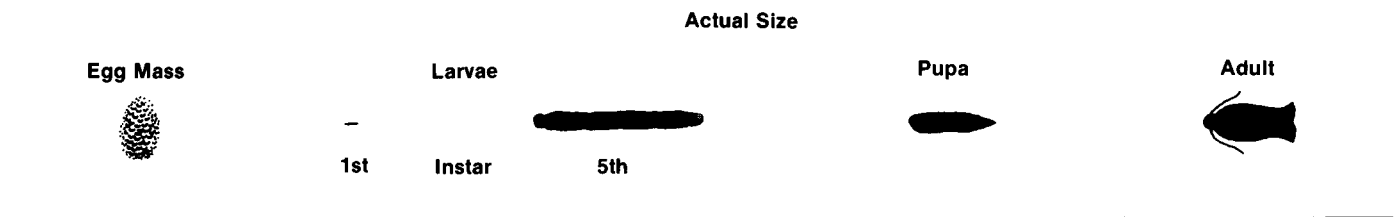
THE EGGS

OBLR eggs are laid on the upper surface of leaves. They appear as greenish yellow masses measuring about 5 x 9 mm (Fig. 2) and may contain 200 or more eggs. The black head capsules of embryonic larvae become visible prior to hatching which usually occurs in 10-12 days.

THE LARVAE

OBLR larvae are indiscriminate feeders that pass through 6 instars. Newly hatched larvae have a yellowish green body and a black head and thoracic shield. Mature larvae are 20-25 mm in length and the head and thoracic shield may be either black or various shades of brown (Fig. 3). The first summer brood of larvae emerge in early July and complete their development in late July or early August. Second brood larvae begin to emerge in mid-August, and feed until they reach the third instar in the fall, when they construct hibernation sites on twigs or bark and enter winter diapause. These overwintering larvae resume activity the following spring when the tree breaks dormancy and complete their development about 3 weeks after the apple blossom period.

Overwintered OBLR larvae (springbrood) first feed on water sprouts and then move throughout the tree. Those



feeding on developing flower buds do so before bloom and continue to consume floral parts throughout the blossom period. After petal fall, these larvae continue feeding on the developing fruit. Newly hatched larvae of the first summer brood move to and feed on tender growing terminals, water sprouts, or developing fruit. As these larvae reach the third instar they display an increasing propensity to damage fruit. The second brood larvae, which develop in late summer and fall, feed primarily on leaves until they enter diapause, although they may occasionally damage fruit.

THE PUPAE

OBLR pupae are dark brown, about 11 mm in length, and are usually found in rolled leaves on the tree.

INJURY

The most serious injury from overwintering OBLR larvae occurs just prior to and shortly after petal fall when the developing fruit is damaged. Many of these damaged fruits drop prematurely, but a small percentage remain on the tree, exhibiting deep corky scars and indentations at harvest (Fig. 4). Leaf injury by all broods is characterized by the larvae rolling leaves and feeding on surrounding foliage (Fig. 5). The first summer brood larvae feed on the surface of developing fruit in late July and early August (Fig. 6). This

injury is similar to that caused by several other species of leafrollers. Fruit damage caused by first summer brood OBLR larvae is usually more serious than spring feeding by overwintered larvae because more of the fruit injured later in the season remains on the tree at harvest.

CONTROL

Several parasites attack OBLR larvae but do not adequately control the pest. Insecticides, effective against large larvae, must be applied at petal fall. If necessary, another spray should be applied in the summer, when most of the summer brood eggs have hatched.

An alternative strategy is to control overwintering larvae at petal fall as previously described, and apply sprays during June to kill the first summer brood adults and newly hatching larvae. Conventional organophosphate insecticides can be used in this program. The flight of adults can be monitored with pheromone traps. The first spray should be applied about 7 days after the first male moth is captured and subsequent sprays should be applied at 14 day intervals as long as the flight continues.

Consult your local recommendations on the use of pheromone traps for this insect and the relative effectiveness of insecticides against OBLR adults, newly hatched larvae, and large larvae.

GUIDE TO STAGES

Stage	Timing	Where to Look
Adults (1st flight)	3 weeks after petal fall and continuing up to 4 weeks	Pheromone traps and resting on upper leaf surfaces.
(2nd flight)	Early August through early September	Same as above.
Eggs	Same as adult flight	Upper leaf surfaces.
Larvae (overwintering)	Previous fall through 2 weeks past petal fall	Overwinters in protected sites throughout tree and in the spring moves to tender growth and flower buds.
Larvae 1st generation	Early July through early August	Terminal growth and developing fruit.
Larvae 2nd generation	Mid August through harvest	Primarily leaves and occasionally fruit.
Pupae	Three weeks past petal fall through early September	Tightly enclosed in or near feeding sites.