

AMORBIA: A CALIFORNIA AVOCADO INSECT PEST

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1. Adult moths, ♂ on left, ♀ on right.



2. Fresh egg mass on avocado leaf.



3. Larva (caterpillar or worm).



4. Pupa.



5. Feeding damage on Bacon avocado.



6. Nest and feeding damage on leaves.

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California avocado growers can usually find amorbia, *Amarina cunearia* (Walsingham), in their groves. (See last page for discussion of name "amorbia".) Occasionally, amorbia populations explode and cause severe fruit damage. In its caterpillar stage amorbia rolls and ties leaves together with a silken web. This forms a shelter or nest in which the caterpillar feeds on leaves and fruit.

Although the insect appears to prefer avocado as a host plant, it is occasionally found in citrus.

What Amorbia Looks Like

Amorbia goes through four stages of development: eggs, larva (caterpillar or worm), pupa, and adult (moth).

Egg. Light green, oval-shaped eggs are laid in flat, overlapping, shingle-like masses of 5 to 100 eggs each. They are generally laid on the upper surface of avocado leaves along the midrib. As larvae develop within the eggs, color changes in the eggs signal that larvae will soon emerge — usually, 13 to 15 days elapse from the time eggs are laid until they hatch. Hatched egg masses appear as whitish to silvery patches on leaf surfaces.

Larva (caterpillar or worm). Newly-hatched larvae are yellowish-green, and gradually turn darker green as they reach maturity. Sometimes, they will spin a web between fruits which touch each other. If disturbed from their shelters, the caterpillars wiggle violently and fall to the ground. As the larvae develop, they go through five to seven growth stages (instars), each larger than the previous stage. Full-grown larvae are 3/8- to slightly over 1-inch long. The larval period averages 9 weeks. The authors have found from one to three larvae living in one nest.

Occasionally, a similar but less important worm pest of avocados, the orange tortrix, may also be found in avocado groves. Orange tortrix larvae may be distinguished from amorbia by size and color pattern. A full-grown tortrix larva will not be over 1/2 of an inch long, and will not have the amorbia's short dark horizontal line just behind the head and above the first pair of legs.

Pupa. The pupa is 1/2- to 3/4-inch long and pale green when first formed; it then turns tan, and at maturity becomes chocolate brown. Pupae are usually found in the same nests as the larvae. The pupal stage averages 17 days.

Adult. The adult (moth) is more or less bell-shaped, and has a wingspan of about 1 inch. Though considerable color variation occurs in both sexes, the (brewings of a typical female are rusty tan, while those of the slightly smaller male are tan, with a triangular dark mark midway on the outer margin of the wings. The moth is active only at night. The female moth lays 400 to 500 eggs during her lifetime. Adult stage of amorbia lasts from 2 to 3 weeks.

Damage

Leaf Damage. Young larvae typically feed only on the surface of avocado leaves, leaving a thin brown membrane or skeleton of leaf veins. More mature larvae feed all the way through the leaf, either starting at the edge or in the center (as does the omnivorous looper). Often, the young larvae web new terminal leaves together and feed within them. As these terminals develop and unfold, feeding damage is revealed. Mature avocado trees can tolerate considerable leaf damage by amorbia larvae without severe effects on tree growth or fruit yield.

Fruit Damage. Fruit damage occurs where a larva webs a leaf against the side of a fruit, or where it webs between touching fruit. In such protected sites the larvae feed on the skin of the fruit. Such feeding will scar the fruit and, if severe enough, the fruit may have to be downgraded or discarded as a cull. A white sugary exúdate is often seen near the feeding damage.

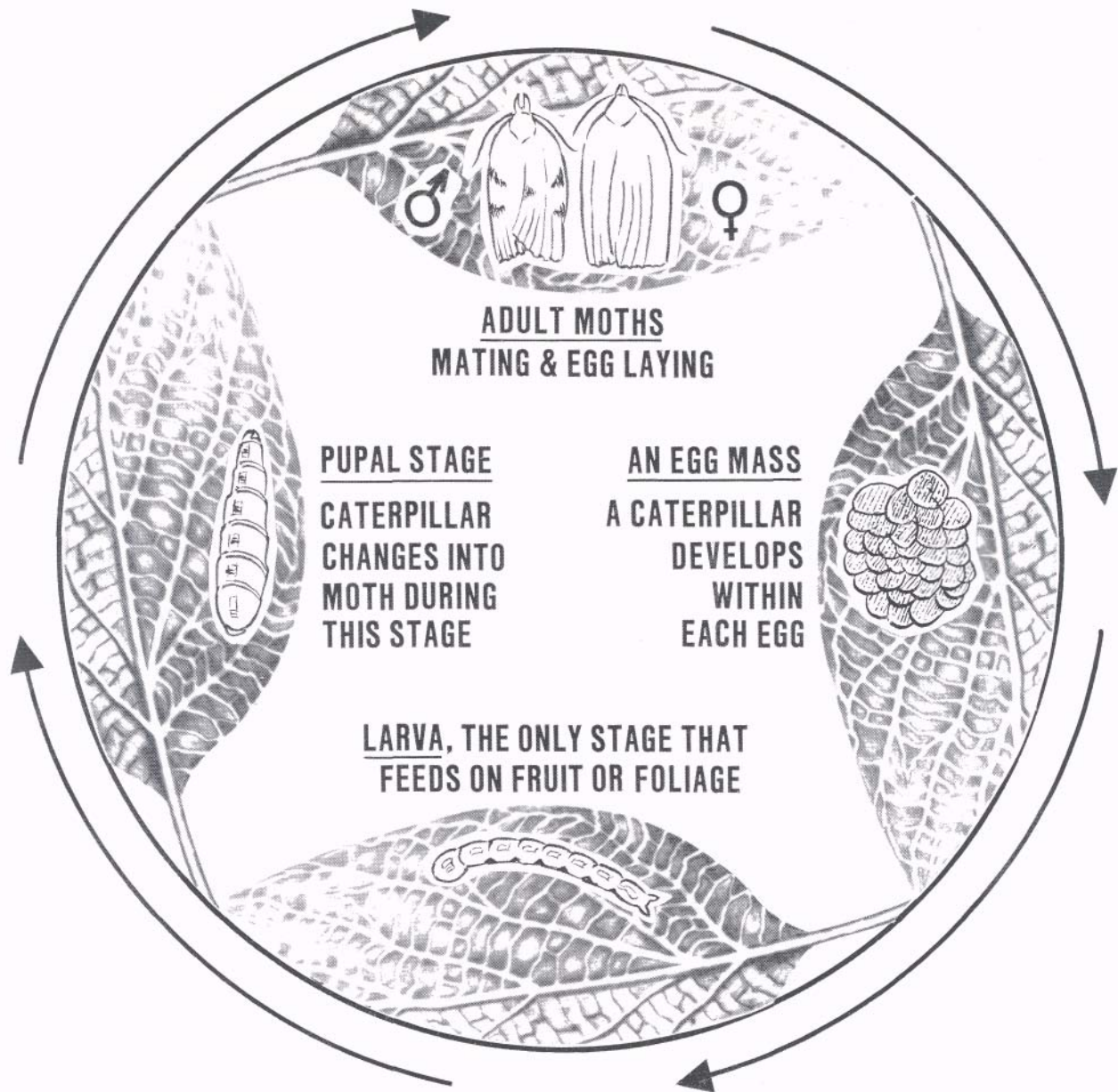
Biological Control

The egg, larval, and pupal stages of amorbia are generally heavily parasitized by a variety of beneficial insects. One of the most effective parasites of amorbia eggs is the tiny wasp *Trichogramma platneri* Nagarkatti. Amorbia egg masses which appear black have probably been parasitized by this beneficial wasp. These wasps are available from certain commercial insectaries in California. A tachinid fly, which is similar in appearance to the common housefly, as well as several parasitic wasps, attack the larval stage. Small brown pupal cases of tachinid flies are often found near the larger parasitized amorbia pupal cases. Beneficial parasites thus play a major role in keeping amorbia populations below economically damaging levels in most California avocado groves.

Life Cycle

The four different stages of an amorbias development include major differences in appearance and activity for each stage. (See below.) Further, the length of time for each of the four stages varies appreciably with changes in temperature. The authors now estimate

that 2 months are required for this insect to complete its life cycle (one generation); they also believe there are about four or five overlapping generations per year. Studies using blacklight traps, insect sex attractants (pheromones), and environmental chambers are in progress and should provide more precise information on this subject.



Amorbia cunearia (Walsingham) belongs to the family Tortricidae, the leafrollers and leaf tiers. Because most California avocado growers know this pest by its generic name, Amorbia, we will continue to use this name until an official Entomological Society of America common name is assigned. An unofficial common name of western avocado leaf roller is listed by the U.S. Environmental Protection Agency. This insect was first described in California in 1922.

Photos 1 through 5 by Max Badgley, Department of Entomology, Riverside. Photo 6 by M.P. Hoffmann.

Life Cycle Sketch by Bill Johnson, Cooperative Extension, Riverside.

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