

Oriental Fruit Moth

Oriental fruit moth, *Grapholita molesta*, is a pest of most stone and pome fruits. In pome fruits, its appearance and injury is similar to that of the codling moth and lesser appleworm.



Oriental fruit moths are gray, with a wing spread of ¼ inch; the wings are gray with dark markings. Photo by G. Krawczyk.

Description and life cycle

Adults are gray, with a wing spread of ¼ inch; the wings are gray with dark markings. Eggs are single, flat, whitish ovals on twigs or the undersides of leaves. Larvae are pinkish white with a black head and reach ½ inch at maturity. Larvae are distinguished from codling moth by the presence of a black anal comb on the bottom of the last body segment.

Generations

Oriental fruit moths have four to five generations per year in Pennsylvania, with the first and last two generations most numerous. They overwinter as larvae in silken cocoons on the tree or on the ground, and they pupate and begin to emerge as adults during April, shortly before peach trees bloom. These females lay up to 200 eggs, primarily during May. The succeeding overlapping generations extend into September and October.

The earliest indication of injury is a dying back of the new growth of twigs in spring. A first-generation larva enters at a leaf axil near the tip of a shoot and bores down the central core for several inches, causing the terminal to wilt, or “flag.” Later

generation larvae may enter the fruit near the stem end and make feeding burrows that can extend to the pit or to the core. In peaches, the mature larva exits the fruit from the side, leaving a large gumming hole with much frass. In apples, Oriental fruit moth larvae may feed around, but not in, the core.

Monitoring and management

Spray timing can be aided by using pheromone traps to establish a biofix (i.e., first sustained capture of two or more moths per trap) and then calculating and recording degree days to determine the percent egg hatch for each generation. Place sex pheromone traps in stone fruit and/or apple orchards in early April and check daily until biofix is established. Then, monitor traps weekly throughout the season. The table below provides application timing guidelines based on degree-days. To use this table, you must record the local temperature each day, beginning with the establishment of biofix. Timing of broad-spectrum insecticide sprays for the first and second generations on peaches are as follows: first generation—150 to 200 and 350 to 375 degree-days following biofix; second generation—1,150 to 1,200 and 1,450 to 1,500 degree-days; and for the third generation, 2,100 to 2,200 and 2,450 to 2,500 degree-days for peaches and 2,450 to 2,500 and 2,900 to 3,000 degree-days for apples. The differences in larval development due to feeding on various food sources (e.g., terminals, fruits, apple, peach) and possible adult movement between adjacent apple and peach orchards contribute to significant overlapping between generations late in the season. Using pheromone traps to monitor the OFM population in each block is necessary to assess the potential problems caused by this pest.



Crop	Application timing a		Comments b					Impo thres exce moth and/ is for
	Crop Stage or DD (°F)							
							2,450-2,500	?
a Application timings for products with ovicidal activity may be earlier (e.g., 100-150 DD) than those specified due to their mode of action. b Pheromone traps catches and monitoring for pest injury (e.g., flagging and fruit injury) should be used to determine the need to spray.								
Peach	1	170-195	10-15	Most important spray on peach for first brood. Pest density determines if second application is needed.	2,900-3,000		?	Important if trap threshold exceeded (>10 moths/trap/week) and/or fruit injury is found.
	350-375	55-60						
Apple	1	Pink	0	To kill adult moths. Most important spray on apple for first brood.			Sept.	?
	350-375	55-60						
Peach	2	1,150-1,200	15-20	Most important spray for second brood. Mating disruption materials such as sprayable pheromones and hand-applied dispensers can be used to manage this pest. If a second pest is also a problem in the same block, select a material that controls both species. Hand-applied dispensers should be placed in the upper level of the tree canopy at the label rate at the pink stage. Various kinds of hand-applied dispensers are available on the market, but even the dispensers with the shortest pheromone release time remain effective for at least 90 days. The sprayable pheromones can be applied together with routine pesticide applications. Their effective time depends on pheromone formulation, rate, and weather conditions. Use only a single application for second brood on peach.				
	1,450-1,500	65-72						
Apple	2	1,450-1,500	?	Very important if trap threshold exceeded (>10 moths/trap/week) and/or fruit injury is found. Use only a single application for second brood on apple.				
Peach	3	2,100-2,200	10-20	Very important if trap threshold exceeded (>10 moths/trap/week) and/or fruit injury is found.				
	2,450-2,500	50-60	Very important if trap threshold exceeded (>10 moths/trap/week) and/or fruit injury is found.					

Table 2-5. Timing of insecticide applications on apples and peaches to control the Oriental fruit moth based on crop stage or degree days from biofix.

Ideally, orchards should be at least 5 to 10 acres in size for mating disruption to be effective. Moreover, monitoring should proceed as usual to check the effectiveness of disruption.

Specific (home) recommendations for home gardeners are in [and/or Fruit Injury for the Home Gardener](#), and recommendations for commercial growers are in the [Penn State Tree Fruit Production Guide](#).

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