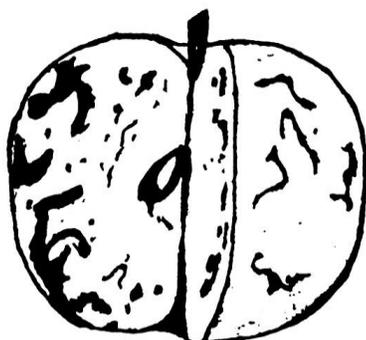




## Apple Maggot

*Rhagoletis pomonella* (Walsh); Family: Tephritidae (Fruit flies)



### Injury

In the fruit growing areas of New York State the apple maggot (AM) or "railroad worm" is one of the most serious pests of apples. All apple varieties are attacked, but summer varieties and early fall varieties are especially subject to injury. The insect also attacks certain varieties of European plums.

Signs of the infestation on the fruit are minute egg punctures in the skin and pitted areas on the surface. In late season varieties, the injury usually appears as corky spots or streaks in the flesh. In the varieties ripening from July to September, open tunnels may occur. Rot-producing organisms follow the maggots, causing rapid decay of infested fruit.

### Life History

The adult apple maggot is a black-bodied fly slightly larger than the house fly. The female is larger than the male, and has four white bands across the abdomen, while the male has only three white bands. The wings of the fly are crossed by four dark bands. The adult flies emerge from their overwintering puparia (cocoon-like structures) in the ground beginning mid- to late June and continue to emerge through mid-August.

The flies require approximately 10 days after emergence to feed, mate, and lay eggs. During this time they may be seen resting on leaves or fruit of apples and other host plants, lapping up drops of honeydew or moisture with their fleshy mouthparts.

The female has a sharp ovipositor with which she punctures the skin of the apple and inserts her tiny whitish egg into the pulp of the fruit. A large number of eggs may be deposited in a single fruit, and fruits of late varieties become dimpled and pitted as a result.

The eggs hatch in 4 to 6 days, young maggots beginning at once to tunnel through the fruit, causing brown trails. Severely infested fruits often fall to the ground early. The numerous trails in the fruit reduce the inside of the apple to a brownish pulpy mass and render it unfit for consumption.

The full grown maggot (about 3/8 inch long) leaves the fallen fruit and burrows into the soil to a depth of 1 to 2 inches. Here it changes to a puparium, in which stage it overwinters. The following year the cycle starts again.

## Monitoring

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Monitoring for these insects will help you determine when apple maggot is active in your area, and this information will help you with management decisions. Home gardeners may use visual traps to effectively monitor apple maggot populations. Red sphere traps and yellow sticky boards are two types available, but red spheres are better and more accurate. Synthetic volatile lures greatly increase the efficiency of traps.

Hang traps at head height, clearly visible on the outside edge of the tree canopy. To determine when the flies are first present, traps should be placed out in mid-June (southeastern NY) to late June (upstate NY).

Traps should be checked 1-2 times per week. Clean traps of insects periodically and recoat with stickum if necessary. No spray treatment is recommended until a cumulative total of 5 apple maggot flies per trap are caught. Trapping can be stopped by August 30.

## Management

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Apple maggots are very difficult to control with insecticide sprays. Adults insert eggs directly into the pulp beneath the skin of the fruit, and the maggots never leave the apple until they are full grown. Likewise sprays applied to the soil are not effective, as the flies can migrate in from hedgerows or abandoned fruit trees nearby.

Picking up and destroying fallen apples at weekly intervals from early August through harvest destroys the larvae within the fruit, and reduces potential for maggot injury the following year. This is most practical where trees are isolated and wild or abandoned trees are not nearby.

**For one to a few dwarf trees:** use red sphere sticky traps for both monitoring and control. Unbaited red sphere traps should be hung in trees at a rate of 1 per 100-150 fruit to help control adult flies; or use 1 trap per dwarf tree, 2-4 per medium tree, and 6-8 per full size tree. Follow manufacturer's directions for placement. Traps for controlling adult flies should be placed by at least mid-July (in eastern NY) to late July.

**In a limited spray program:** an application of Kaolin, during mid-July in southeastern NY, or the first week of August in upstate NY, may be sufficient to reduce damage to an acceptable level. Combine with the use of red sphere sticky traps, three or four per tree, to control adults. Scrape off flies and resurface with stickum one or two times per week. Proper timing of the spray applications and thorough coverage of fruit and foliage are as important as the insecticide used. The spray should be applied until it starts to drip from fruit and foliage.

**In conventional spray programs:** the first spray is applied 7-10 days after the first apple maggot fly has emerged, using traps to monitor the population. The flies do not begin to lay eggs for 10 days after emergence, and during this time feed on moisture present on the fruit foliage. Spray with Kaolin or a multipurpose fruit tree spray every 10-14 days from mid-July to late August, or begin in early July on Long Island and in southeastern New York.

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