

Managing Western Cherry Fruit Fly in the Home Garden

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Western cherry fruit fly, *Rhagoletis indifferens* Curran, was first discovered in western Colorado in the late 1990's. It is now present in most areas where backyard cherries are grown. Western cherry fruit fly larvae feed within developing and ripening cherries, making them unusable. Several sprays must be applied to control this pest, making a once easily grown crop much more difficult.



Figure 2. Wing patterns are used for identification of fruit fly species. Several fruit fly species could potentially attack cherries.

Western cherry fruit flies are native to northwestern North America, and probably evolved on native cherry species. They feed exclusively on cherries, and almost all cherry types and varieties are attacked, although some types are preferred over others. These fruit flies (Diptera:



Figure 1. Western cherry fruit fly adults are seldom seen, but can be identified by dark patterns on the wings.

Tephritidae) are closely related to other species of eastern US cherry fruit flies as well as apple maggots, walnut husk flies and Mediterranean fruit flies. Other species of tephritid fruit flies can occasionally cross over from their typical host plants onto cherries. Cherries grown near hawthorn thickets at higher elevations in western Colorado may become infested with hawthorn maggots. If you are located in an area in which western cherry fruit flies have not been recorded, it is important to trap or



Figure 3. Larvae of cherry fruit flies feed within the cherry, making them unusable.

rear adult flies from infested cherries to confirm their identity.

As of 2010, western cherry fruit flies have been recorded from most areas in which sweet and tart cherries are grown in western Colorado. This includes back yard gardens as well as commercial production.

There is very low tolerance for western cherry fruit fly in commercial cherry orchards, meaning that control efforts must be near perfect. Regulatory restrictions regarding the movement of infested cherries apply to interstate movement, especially to California. However, it is very important that backyard cherry growers take efforts to control cherry fruit flies to minimize chances of them moving into nearby cherry trees.

LIFE HISTORY

Western cherry fruit flies have a single generation per year. They spend the winter as a pupa in the soil, and then emerge as adult flies over an extended time period, which may be two months, during the late spring/early summer. The first flies typically emerge in mid May in the warmest areas of western Colorado. Some pupae may remain dormant in the soil for several years before emerging.

Adult flies are smaller than a house

fly, have black bodies with thin white stripes across the abdomen and yellow markings on the thorax (Figure 1). Adult fruit flies are identified by the unique pattern of black markings on the wings (Figure 2). They are not strong fliers, and therefore tend to inhabit the first cherry tree they encounter. The female is mature enough to lay eggs 7-10 days after emerging. The adult flies will feed on pollen or aphid honeydew during the pre-oviposition period. The female punctures the skin of the developing cherry with her ovipositor, and lays an egg. She may feed on juices that seep out of the oviposition puncture. The life span of an adult fly is about 16-35 days.

The eggs are laid over a period of three weeks during optimal temperatures of 75-85°F. A range of 50 to 200 eggs can be laid by one female with each egg being deposited singly in a cherry. It takes up to 5-8 days for the eggs to hatch.

Larvae are white and maggot-like, and bore into the cherry where they feed and mature (Figure 3). They spend 10-12 days inside the cherry, before tunneling out, falling to the ground, and burrowing into the soil beneath the tree to pupate. The pupae remain in the soil until the following spring. The pupae measure about 4-5 millimeters in length. At maturity they are about 5-6 millimeters long.

MANAGEMENT

Control of fruit flies with insecticides must be preventative in nature. Once eggs are deposited under the skin of the cherry, the damage is irreversible. Sprays are aimed at adult flies with the goal of killing them before they get a chance to lay eggs. Spray residual must cover the entire cherry, at a high enough concentration to kill the adult flies before they have a chance to lay eggs.



Figure 4. Yellow sticky traps are used to monitor fruit fly populations to determine if they are present, and when emergence begins in the spring.

Western cherry fruit flies are capable of laying eggs about 7-10 days after they first emerge in the late spring. Because of the extended flight, most cherries have to be protected with numerous sprays. The initial spray must be applied before egg laying begins.

Yellow sticky traps (Figure 4) are used to evaluate western cherry fruit fly presence and emergence. Traps should be in place by mid-May, or when developing cherries are light green in color. It is best to place them in sunny, exposed areas at eye-level. Traps should be monitored daily until the first fly is caught. The spray program should begin about one week to ten days after the first fly is caught. Males emerge first and are the first flies to be captured. Females emerge a few days after males. The 7-10 day waiting period after the first fly is captured gives time for female emergence and mating before the first spray is applied.

Once the first spray is applied, subsequent applications are applied on a

calendar basis. The schedule is based on insecticide residual, as the cherries must be protected from egg laying flies at all times. Residual activity is dependent on the chemical properties of the particular material that is used, and the growth rate of the cherries. A fast growing cherry will “outgrow” insecticide coverage, so sprays need to be applied more often as the cherries expand in size.

There are limited insecticide active ingredient options for western cherry fruit fly control for the home gardener. Label instructions vary with different products, so always read and follow label directions for whatever product you use.

- Spinosad is an insecticide that is a byproduct of a natural bacterial fermentation process. It is available in several products. Not all spinosad products are registered for use on cherries, so read the label before purchasing any product. Spinosad is the least toxic (to mammals) of the materials available for fruit fly control in cherries. It has a residual of about 5-7 days when applied at the highest allowed rate. It should be used on a seven day schedule once adult flies are active. Spinosad cannot be applied within seven days of harvest. A bait formulation of spinosad, GF-120 Naturalite Fruit Fly Bait, is available and very effective, but it is only in commercial-sized packaging. Several spinosad formulations are accepted for organic production.
- Carbaryl-based insecticides are sold under several trade names, often as Sevin. This insecticide is effective against fruit flies, but repeated use can cause outbreaks of spider mites.

Repeated use is not encouraged, but it can be useful if rotated with other labeled insecticides. The pre-harvest interval and use restrictions vary with carbaryl products, so it is important to read and follow label directions.

- Several products with malathion as the active ingredient are available for use on cherries. These materials are not generally recommended, except for use in the week before harvest. Malathion does not have more than a few days residual, so repeated use on a short schedule would be necessary for good control. Most malathion formulations have a 3 day pre harvest interval, so they would be a good choice if sprays are needed within the last week before harvest.
- Two pyrethroid insecticides, permethrin and esfenvalerate, are occasionally available for cherry fruit fly control in home-use formulations. There are many commercial products available with these insecticides as the active ingredient, but only a few are labeled for use on cherries, so it is important to read the label carefully before buying any pesticide. Pyrethroid insecticides will give a week or more of residual activity. Trees should be sprayed on a weekly basis while the fruit is expanding.
- There are many commercial insecticides labeled for use against cherry fruit flies, but their expense and packaging usually limits their use to commercial applicators. For an up-to-date listing of all insecticides registered for use on cherries, refer to the 2011 Utah-