



The Western Cherry Fruit Fly and Your Backyard Cherry Tree

WASHINGTON STATE UNIVERSITY EXTENSION FACT SHEET • FS125E

Introduction

There are several reasons homeowners in Washington State give for planting cherry trees in their backyards. One is the beauty of these trees at flower bloom in early spring. Another is the attractive contrast of small red fruit on dark green leaves at harvest time (Figure 1). Also, it can be very satisfying to supply family and friends with sweet cherries from your own backyard tree. However, before planting a backyard cherry tree, homeowners should consider the challenges of pest management, especially management of the western cherry fruit fly (WCF).

Economic Impact of the Western Cherry Fruit Fly

The western cherry fruit fly, *Rhagoletis indifferens*, is a threat to Washington State's Yakima Valley, Wenatchee Valley, and Columbia Basin cherry industries because cherries infested with fruit fly maggots will not be accepted by most local and export markets. Washington State is the nation's number one producer of sweet cherries—a crop that contributed nearly 500 million dollars to the local economies of cherry-producing regions in 2011.



Figure 1. The beauty of Bing and Rainier sweet cherry varieties just prior to fruit harvest. Photo by Mike Bush, WSU Extension.

Since it is essential to protect these regions from the WCF, residents who live in one of these areas should find it easier to buy cherries at a local fruit stand rather than to keep a backyard cherry tree free of cherry fruit fly maggots. Additionally, in the cherry-producing areas of Washington State, landowners are legally responsible for controlling the WCF in host trees on their property (see Revised Code of Washington 15.09 at <http://apps.leg.wa.gov/rcw/default.aspx?cite=15.09.060>).

The rationale behind this law is to protect Washington State fruit growers from economic losses when fruits infested with the WCF are rejected or when additional management strategies (often pesticide applications) are required to protect crops from infested trees outside the commercial orchard.

Western Cherry Fruit Fly Identification and Biology

WCF host trees include fruit-bearing trees that produce sweet, tart, and wild species of cherries, as well as ornamental cherry trees where the rootstock has been allowed to grow, flower, and produce cherries. Fruit infested with the cherry fruit fly larvae, known as maggots, may have a dimpled



Figure 2. External signs of sweet cherry infested by western cherry fruit fly—some dimpling and maggot breathing holes. Photo by Mike Bush, WSU Extension.

appearance (Figure 2), but the maggots can still be difficult to detect when examining the surface of the fruit. However, as the maggots mature, they break the surface of the cherry and open a hole in order to breathe and exit the fruit.

An adult cherry fruit fly is less than 1/4-inch long with a dark body and a white spot on the middle of its back between a pair of banded wings (Figure 3). The WCFF can be identified by the unique pattern of dark bands on its wings. One mated female WCFF can lay an egg under the surface of dozens of ripening cherries. The WCFF eggs hatch into maggots that tunnel and feed inside the fruit. These maggots are legless and lack a head capsule, but they do have unique spiracles or “breathing tubes” and retractable mouth hooks that help them feed and tunnel (Figure 4). As the maggots approach maturity, they can be as long as 5/16 of an inch (Figure 5). When mature, maggots leave the cherry, drop to the ground, and pupate (become a pupa, the non-feeding life stage between the larva and adult stages). The WCFF overwinters in this pupal stage.

Pest Management Strategies

Since the WCFF spends a considerable portion of its life as a pupa hidden in the soil beneath a host tree and as a maggot protected within the cherry fruit, there are relatively

few proven strategies that homeowners can use to manage this pest.

Non-chemical strategies

The primary non-chemical strategy to manage the WCFF is to pick off every cherry from the tree at harvest. This removes any maggot-infested cherries and any cherry left hanging on the tree after harvest that could serve as a cherry maggot’s residence, hosting next year’s “crop” of WCFF.

If homeowners are determined to plant their own backyard cherry tree, they may find it useful to consider purchasing and planting cherry trees that are grown on semi-dwarfing rootstocks. This will help keep the overall height of the mature fruit tree to a more manageable size (between 10 and 12 feet). In turn, dwarfing rootstocks serve to keep the fruit-bearing zone lower to the ground, reducing the need for ladders to manage and harvest the homegrown cherries.

Regardless of the rootstock chosen, overall tree size is best maintained by proper training and pruning. Even standard-sized trees, which normally grow from 30 to 40 feet tall on seedling rootstock, can be kept to a height of 10 to 12 feet through proper annual pruning and training (shaping) overly upright limbs.



Figure 3. An adult western cherry fruit fly at about 1/5-inch long. Note the dark body, white spot on its back, and the distinct pattern of bars on the wings. Photo by Mike Bush, WSU Extension.



Figure 5. Nearly mature WCFF maggot inside a sweet cherry. At maturity this maggot can be nearly 5/16-inch long. Photo by Mike Bush, WSU Extension.

Figure 4. WCFF maggots have no identifiable head capsule, but they do have (A) unique anterior breathing “digits” and (B) mouth hooks to aid them in feeding. Photos by Mike Bush, WSU Extension.

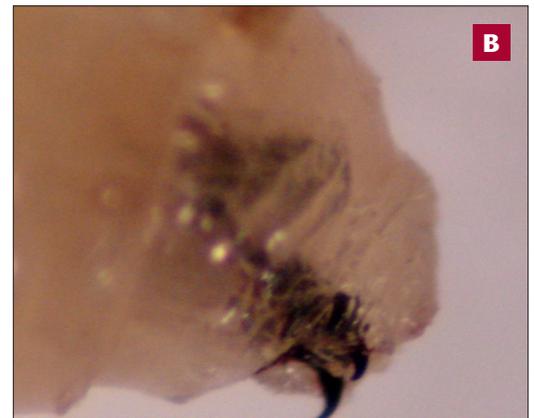




Figure 6. Close-up view of WCFF adults caught in a yellow sticky-card trap showing their distinctive barred wing pattern. Photo by Mike Bush, WSU Extension.



Figure 7. A yellow sticky-card trap with attached ammonium carbonate lures can be used to trap and monitor the flight patterns of WCFF adults. This information helps to better time pesticide spray applications. Photo by Mike Bush, WSU Extension.

The adult WCFF can be caught on yellow sticky-card traps hung on the branches of a cherry tree. The yellow coloration attracts the WCFF, and the adhesive on the surface of the cardboard panel traps them (Figure 6). The number of flies caught can be increased by the addition of ammonium carbonate lures (Figure 7). Note that trapping with sticky-card traps can reduce, but not eliminate, the number of adult fruit flies in a backyard cherry tree. The traps are used predominantly to monitor the presence of the WCFF in fruit trees and aid with the timing of pesticide applications. They are not a strategy for overall WCFF control.

Chemical strategies

Currently, there are several home garden insecticide products that are labeled for use on backyard fruit trees. For a list of products (including organic products), homeowners can contact their local WSU Extension office or access the

WSU Hortsense website at <http://pep.wsu.edu/hortsense/>. These insecticides target the adult WCFF in a host tree's canopy and should be applied within seven days of capturing the first fruit fly on a yellow sticky trap, or when red cherry varieties first show a straw-colored blush, which usually occurs in late May to early June.

WCFF adults will continue to emerge from pupae in the soil from May to cherry harvest, as well as throughout late summer. Thus, an effective pesticide strategy will rely on multiple applications of pesticides spaced days or weeks apart in accordance with the pesticide label. It is important to check the pesticide's pre-harvest interval (the time between the last pesticide application and harvest of the treated crops) to allow time for pesticide residue to dissipate before cherry consumption. Following this schedule may require at least four pesticide applications each season.

Conclusion

If you plant cherry trees in your backyard, it is likely that the western cherry fruit fly will find them. So pest management is important, especially in commercial cherry-producing areas of the state.

Effective management of the WCFF will require multiple pesticide applications to the host tree's canopy that are properly timed to reduce adult fly populations as they emerge from the soil beneath trees. Also, WCFF management will be considerably easier for homeowners who plant fruit trees grafted to dwarfing rootstocks.

Homeowners who do not want to spray pesticides to control the WCFF should consider removing their backyard cherry trees and replacing them with a non-host fruit tree, such as plum, peach, or apricot because these fruits can be grown safely in the cherry-producing regions of eastern Washington and they have fewer fruit-infesting pests.

Further Reading

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- Olsen, J. 2011. Training and Pruning Your Home Orchard. *Oregon State University Extension Publication PNW 400*. <http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/22166/pnw400.pdf>.
- WSU Extension. 2013. Cherry: Cherry Fruit Fly. In *Hortsense: Home Gardener Fact Sheets for Managing Plant Problems with IPM or Integrated Pest Management*. Washington State University. <http://pep.wsu.edu/hortsense/scripts/query/displayProblem.asp?tableName=plant&problemID=52&categoryID=3>.



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Use pesticides with care. Apply them only to plants, animals, or sites as listed on the label. When mixing and applying pesticides, follow all label precautions to protect yourself and others around you. It is a violation of the law to disregard label directions. If pesticides are spilled on skin or clothing, remove clothing and wash skin thoroughly. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.

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