

Exotic Fruit Fly Quarantines

Grower Guide

Background

California is experiencing an unusually high number of Exotic Fruit Fly (EFF) detections this season. This is a major concern for the agriculture industry in California. The larval (maggot) stage of fruit flies can damage beyond salvageability most of the fruits and vegetables produced in California. One estimated cost of just the Oriental Fruit Fly (OFF) in California would range from \$44 to \$176 million in crop losses, additional pesticide use, and quarantine requirements.

In response to this pressing issue, the California Department of Food and Agriculture (CDFA), in cooperation with the United States Department of Agriculture (USDA) and County Agricultural Commissioners, has initiated local regulatory measures to eradicate and prevent the statewide spread of Queensland fruit fly, Tau fruit fly, Mediterranean fruit fly, and Oriental fruit fly.

For the most up to date information, visit the [CDFA website](#) which includes information on:

- Most [up-to-date quarantine maps](#) and regulatory information
- [Pest profile information](#) for the various fruit flies.

For CDFA email updates on specific species, sign up [here](#).

For questions about a fruit fly quarantine/eradication or possible infestation of fruits and vegetables with fruit fly larvae, call the CDFA Exotic Pest Hotline at [1 \(800\) 491-1899](#).

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Growers Within a Quarantine Area

If you are in a quarantine area:

- Identify if your crop is a host for EFF. [See host list below.](#)
- Inspect for signs of invasive fruit flies or maggots and report any findings to the CDFA hotline at 1-800-491-1899 or your [local county agricultural commissioner's office.](#)
- Please cooperate with agriculture officials and allow them access to inspect plants. [See EFF descriptions below.](#)

Q. How are various fruit fly quarantines triggered?

- A quarantine is triggered by the number of adult flies captured—within three miles of each other and in one life cycle:
 - Mediterranean, Melon, Caribbean fruit fly – 2
 - Mexican fruit fly – 5
 - Oriental, Guava, Peach fruit fly – 6 Rural or 8 Urban
 - All other adult invasive fruit flies (e.g., Queensland fruit fly) – 2

OR

SINGLE detection of larva, mated female, or pupae indicating a breeding population.

Quarantine – The establishment of a quarantine imposes a restriction on movement, possession, and sale of commodities covered. Prohibited processing and movement from, within, or across the area under quarantine may require pre- and post-harvest treatments, shipping documents, or other authorization.

Exceptions under provisions are specific to each Exotic Fruit Fly species:

- [Queensland Fruit Fly](#): Pg 5, Section D
- [Tau Fly](#): Pg 5, Section D
- [Mediterranean Fruit Fly](#): Pg 12, Section D
- [Oriental Fruit Fly](#): Pg 13, Section D

A quarantine zone is established after emergency response triggers are met. [USDA APHIS PPO](#) and state cooperators engage in year-round or seasonal detection trapping for exotic fruit flies. If Exotic Fruit Flies are detected via trapping, subsequent delimitation trapping takes place over a period of time (depending on the species) that would indicate if the EFF detection was a “transient” (non-established) event, or if establishment has occurred via reproduction.

[Triggers for quarantines:](#)

- Quarantines are triggered after a target number of species detections. Quarantine boundaries are established radiating from each fly found.
- Once a new, exotic fruit fly quarantine is enacted in an area, to [halt the movement](#) of all possibly compromised fruit fly host material within the vicinity of the fly found, a Hold Notice is issued to each fly find property, stopping movement of all potentially infested fruit, regardless of whether it was grown or brought into the area.

- According to the [CDFA Regulatory Response Manual](#) (pg. 14), when a quarantine is established in an agricultural area, a phone tree is set up with all affected growers and establishments to notify them of imminent meetings within the quarantine area, which will provide them with regulatory information and provide each of them with an opportunity to sign a compliance agreement. Additionally, an announcement to states receiving agricultural products from California and a notification to international trading partners may be issued.

Q: What is considered the “core area” around a fruit fly detection?

- The core area is part of an established quarantine area and is comprised of a 0.5-mile radius surrounding the detection of a fruit fly.

Q. How large is the fruit fly quarantine zone(s)?

- There are three main areas to consider within the fruit fly quarantine zone, and each has different requirements for harvest/bulk citrus movement:
 1. The property where a detection occurred
 2. Core Area: A one-half-mile radius around each detection
 3. Quarantine Area: A 4.5-mile radius around each detection

Q. What steps must growers in these three areas of the quarantine zone follow to harvest/move their bulk citrus?

- For properties where the detection occurred and properties within the core area (0.5-mile radius around the detection site):
 - Produce is not eligible for packing, but may be stored, [processed](#), and consumed on the growing site. If properties within the core areas have no fruit fly or life stages detected on the growing grounds, produce can only be moved for [juicing](#), [processing](#), [freezing](#), etc. under compliance and safeguarding with the approval of the receiving county ag commissioner and any applicable transiting counties.
 - Ag commissioners of the county where the fruit would be received and processed do have the ability to refuse acceptance of the produce, and Ag commissioners in transiting counties may also prohibit transit.
 - Host produce should be removed from the tree and properly disposed of and not left in the field.
 - Host produce should be sent to an approved landfill or be composted, buried on site, or otherwise processed on-site in any of the approved methods under supervision by CDFA, USDA and/or the County Agricultural Commissioner.
 - Produce can be harvested and fumigated followed by a prescribed cold treatment. The fumigator and fumigation site require certification. All treatments must be conducted in accordance with the [USDA Treatment Manual](#).
- For properties outside of the core area, but inside of the quarantine zone:
 - Growers can apply regular [pre-harvest treatments](#) with approved insecticides, applied at recommended intervals, starting a sufficient time before harvest (but

not less than 30 days, but may go as long as 100 days depending on the [pre-harvest treatment window](#), before harvest and a minimum of 4 treatments) to allow for the development of fruit fly eggs and larvae. Determination of the [pre-harvest treatment window](#) is based on the degree day model for the specific fruit fly. Once treatment has begun, it must continue through the harvest period.

- The bait treatments must be made under a compliance agreement.
- Growers can also opt to remove and dispose of host produce.
- Eligible fruit fly host commodities can be harvested and fumigated followed by a prescribed cold treatment. The fumigator and fumigation site will require certification, and the treatment protocol is the same as fruit located within the core area above.
- All growers are encouraged to reach out to their local County Agricultural Commissioner.

Q. What about other host crops in the quarantine zones intended for export?

- The various quarantine situations can change rapidly, including the requirements of other states and countries. It is critical to stay in communication with your export certifier for the latest updates.

[See Host List below](#)

Q: Can packers receive and pack produce grown outside of the quarantine area?

- Produce grown outside the quarantine area can be packed in packinghouses in the quarantine area under certain protocols. However, some export destinations will not accept produce that is packed in a quarantine area, even if it is grown and harvested outside the quarantine area. Growers are encouraged to work directly with their packinghouse.

Q. Is produce from a quarantine area able to be exported?

- Some countries will accept produce from a quarantine area that has been treated; however, some countries will not. For the most recent information, contact your export certifier.

Growers Adjacent to a Quarantine Area

Q: What can the industry do proactively?

- Pre-harvest treatments may be implemented in case a fruit fly is found nearby and the quarantine area expands.
- Treatments for non-quarantine areas are not mandatory but may help assure that growers will be able to continue harvesting and shipping their produce should the quarantine expand and include their property.
- Treatments for non-quarantine areas are done in the same manner as the pre-harvest quarantine treatments for quarantine compliance.
- County Agricultural Commissioners may issue a Treatment Agreement and monitor all pre-quarantine treatments.
- Growers of nursery stock host plants may consider keeping them free of produce. In the event of a fruit fly quarantine, host plants with produce are placed on hold and the produce must be removed.

Q: What can packinghouses or nurseries do proactively?

- Packinghouses may encourage growers of host commodities to participate in voluntary, pre-quarantine treatments so harvest may occur as intended.
- Nurseries may consider continuously monitoring host nursery stock and keeping them free from produce. In the event of a fruit fly quarantine, host plants with produce are placed on hold and the produce must be removed.

Q: Can packers receive and pack produce grown outside of the quarantine area?

- Produce grown outside the quarantine area can be packed in packinghouses in the quarantine area under certain protocols. However, some export destinations will not accept produce that is packed in a quarantine area, even if it is grown and harvested outside the quarantine area. Growers are encouraged to work directly with their packinghouse.

CDFA Activities

Q: What are CDFA, the USDA, and County Agricultural Commissioners doing about this?

- The USDA has announced \$103.5 million in additional funding to address fruit fly programs in California and elsewhere.
- The agencies are cooperating in trapping, treatment, and quarantine efforts to address the increased number of fruit fly introductions.
- The USDA has deployed trapping staff from throughout the United States to assist with fruit fly projects in California.
- USDA has also deployed an Incident Management Team to assist with planning, logistics, and outreach efforts for the Oriental Fruit Fly project in San Bernardino and Riverside counties.
- Counties continue to support the eradication projects and are providing additional staff to help with trapping, treatment, and quarantine activities.
- CDFA has partnered with the California Conservation Corps to help with trapping, larval surveys, and fruit or produce stripping.
- CDFA, USDA, and County Agricultural Commissioners acknowledge the burden that is placed on growers of all sizes who participate in invasive pest response activities. While these actions may feel cumbersome, the cost to manage invasive fruit fly populations now is far less than the potential costs or loss to the agricultural industry should these fruit flies become established in California.

Q. What can the industry do to help spread the word about the risks?

- Remind fellow industry members of the importance of following quarantine regulations and encourage them to invest in pre-harvest treatments.
- Report any suspected invasive fruit fly sightings to CDFA, USDA, or your local County Agricultural Commissioner.
- Encourage area residents to avoid moving any homegrown produce from their properties and to cooperate with agriculture officials working in their area.
- Help spread the “Don’t Pack a Pest” message to travelers or those receiving produce in the mail or through other shipping channels.
- Share social media posts created or shared by CDFA, USDA, or County Agricultural Commissioners.

Impacted Crops

Crop	Queensland Fruit Fly ¹	Tau Fly ²	Mediterranean Fruit Fly ³	Oriental Fruit Fly ⁴
Almond			x	
Apple	x			x
Apricot	x		x	x
Avocado		x	x	
Banana (Fresh, Plantain)	x	x	x	x
Bilimbi				x
Bitter Melon (Balsam Apple, Pear)		x		x
Blackberry	x		x	
Blueberry	x		x	
Breadfruit	x		x	
Cabbage		x		
Calamondin			x	x
Canistel (Egg Fruit)			x	x
Cape Gooseberry (Goldenberry, Ground Cherry)	x		x	x
Cashew	x		x	
Chayote		x		
Cherimoya	x		x	x
Cherry, Sweet, Sour	x	x	x	x
Chinese Banyan				x
Citrus	x		x	x
Coffee	x		x	x
Crab Apple			x	x
Cucumber		x		x
Custard Apple (Sugar Apple)			x	x
Date Palm	x		x	x
Dragon Fruit	x	x		x
Eggplant	x	x		x
Fig	x	x	x	x
Gooseberry			x	
Gourd		x	x	

Grape	x		x	x
Guava	x		x	x
Jaboticaba			x	
Jackfruit	x	x		x
Java Apple			x	x
Jujube	x		x	x
Kiwi	x		x	
Langsat (Lanzones)				x
Litchi	x		x	x
Longan	x	x	x	x
Loofa		x		x
Loquat			x	x
Mango	x	x	x	x
Mangosteen			x	x
Melon (inc. Cantaloupe, Honeydew, Muskmelon)		x		x
Mombin (Hog Plum)			x	x
Mountain Apple (Rose Apple)				x
Mulberry, White, Black		x	x	x
Nectarine	x		x	x
Noni		x		
Okra		x		
Palmyra palm		x		
Papaya		x	x	x
Passionfruit (Passionflower)	x	x	x	x
Peach	x		x	x
Pear, European, Asian	x	x	x	x
Pepper, Sweet, Hot	x	x	x	x
Persimmon	x		x	x
Pineapple				x
Plum, European, Japanese	x	x	x	x
Pomegranate	x		x	x
Prickly Pear Cactus			x	x
Pumpkin (inc. Acorn, Ornamental gourds)		x		x

Quince	X		X	
Rambutan				X
Raspberry	X		X	
Rose Apple (Malabar, Maylay, Java)	X	X		X
Santol (Cottonfruit)			X	X
Sapodilla (Sapote)	X	X	X	X
Soursop	X	X	X	X
Squash		X		X
Starfruit (Carambola)		X	X	X
Strawberry	X			
Tomato	X	X	X	X
Tree Tomato (Tamarillo)				X
Walnut, Black, English			X	X
Wampi			X	X
Water Apple (Watery Rose Apple)				X
Watermelon		X		X
Zucchini (Summer Squash)				X

For the full comprehensive host list please visit:

- 1 https://www.aphis.usda.gov/plant_health/plant_pest_info/fruit_flies/downloads/fruitfly-trapping-guidelines.pdf
- 2 https://www.cdfr.ca.gov/plant/pdep/target_pest_disease_profiles/docs/tau-ff-hostlist.pdf
- 3 https://www.aphis.usda.gov/plant_health/plant_pest_info/fruit_flies/downloads/host-lists/medfly-host-list.pdf
- 4 https://www.aphis.usda.gov/plant_health/plant_pest_info/fruit_flies/downloads/host-lists/off-hostlist.pdf

References

- [CDFA Regulatory Response Manual](#)
- [USDA Treatment Manual](#)
- [APHIS EFF Quarantine Map](#)
- [California Agriculture Commissioners](#)
- [Queensland Fruit Fly Host List](#)
- [Tau Fly Host List](#)
- [Mediterranean Fruit Fly Host List](#)
- [Oriental Fruit Fly Host List](#)

EFF Descriptions



bugwood.org/cdf

Queensland Fruit Fly

Impacted Crops

See [Crop List](#)

- [Quarantine Map](#)

Description

The adult female QFF is approximately 6 mm in length, it has a wing expanse of 10 to 12 mm, and it has transparent wings. Body coloration is brown marked with yellow. The dorsum of the thorax has a broad creamy band with a narrow yellow stripe on either side. The abdomen is constricted at the base, and broadly rounded at the tip.

- [Pest Profile](#)
- [Quarantine Boundaries](#)



Fan Geo/CDFA

Tau Fly

Impacted Crops

Tau fly has a [broad host range](#); at least 34 hosts in nine plant families are reported, including melon, okra, peppers, papayas, citrus, cucumber, pumpkin, avocado, tomato, and gourds. It is considered a significant pest of cucurbits.

- [Quarantine Map](#)

Description

The adult tau fly is approximately 7 mm in length (similar to that of a housefly). The body is yellow with black markings. The clear wings have two dark stripes, one along the front margin that ends in a dark spot and one about half as long running diagonal from the wing base. The female has a pointed slender ovipositor to deposit eggs under the skin of host fruit. The egg is almost one millimeter in length, white, cylindrical, and about four times as long as wide. The larva is creamy-white, legless, and may attain a length of nine millimeters. The pupa is encased in a dark brown cylindrical puparium.

- [Pest Profile](#)
- [Quarantine Boundaries](#)



CDFA

Mediterranean Fruit Fly

Impacted Crops

Apple, apricot, avocado, bell pepper, carambola, coffee, dates, fig, grape, grapefruit, guava, lemon, lime, loquat, lychee, mango, nectarine, orange, papaya, peach, pear, persimmon, plum, pomegranate, pummelo, quince, sapote, tangerine, tomato, and walnut.

- [Quarantine Map](#)

Description

The Mediterranean fruit fly is a short, squat fly about 1/4 inch in length. A blackish thorax is marked with silver; a tan abdomen with darker stripes extending across the abdomen; and clear wings with two light brown bands across the wing, and along the distal front edge, and gray flecks scattered near the base. The immature stages appear similar to other EFF. Eggs are white, very small, elongate, and somewhat banana-shaped. Larvae are white, legless, and somewhat carrot-shaped. The pupa is contained inside an elongate oval, shiny brown, hard puparium.

- [Pest Profile](#)
- [Quarantine Boundaries](#)



CDFA

Oriental Fruit Fly

Impacted Crops

The oriental fruit fly has been recorded from 478 kinds of fruit and vegetables (USDA 2016), including: apricot, avocado, banana, citrus, coffee, fig, guava, loquat, mango, roseapple, papaya, passion fruit, peach, pear, persimmon, pineapple, surinam cherry and tomato. However, avocado, mango and papaya are the most commonly attacked. PDF with species list [here](#).

- [Quarantine Map](#)

Description

The adult oriental fruit fly is somewhat larger than a housefly, about 8 mm in length. The body color is variable but generally bright yellow with a dark "T" shaped marking on the abdomen. The wings are clear. The female has a pointed slender ovipositor to deposit eggs under the skin of host fruit. Eggs are minute cylinders laid in batches. The maggots (larvae) are creamy-white, legless, and may reach 10 mm length inside host fruit.

- [Pest Profile](#)
- [Quarantine Boundaries](#)