

## **SUMMARY/BACKGROUND**

- The Oriental fruit fly (OFF) is an invasive pest that attacks over 230 crops: including citrus and other fruits, nuts, vegetables and berries. The short life cycle of the OFF allows rapid development of serious outbreaks, which can cause severe economic losses. Heavy infestations can cause complete losses of crops.
- A great number of crops in California are threatened by the introduction of this pest: including apple, apricot, avocado, bell pepper, fig, grape, grapefruit, lemon, lime, melons, nectarine, orange, peach, pear, persimmon, plum, pomegranate, tangerine, tomato and walnut. In California, the combined 2015 gross value of the commercial hosts potentially affected was over \$16.4 billion.
- Establishment of these flies would cause direct economic losses via damaged fruit, increased pesticide use statewide by commercial and residential growers in efforts to lessen this damage, loss of revenue due to export restrictions on fruit both domestically and internationally, and adverse impacts on native plants through the destruction of their fruit.
- OFF is widespread through much of the mainland of southern Asia and on neighboring islands.
- OFF was first recorded in Hawaii in 1946, and it now attacks nearly every commercial fruit crop grown there except pineapples.
- OFF was first found in California in 1960 and has been reintroduced every year since 1966 through the movement of infested fruits and vegetables into the state. Numerous eradication efforts undertaken by CDFA and USDA over the years have prevented these introductions from becoming permanently established.

## **LIFE CYCLE**

- Female OFF lay eggs in groups of 3 to 30 under the skin of host fruits. A single female can lay more than 1,000 eggs in her lifetime. Maggots tunnel through the fruit, feeding on the pulp. They shed their skins twice and emerge through exit holes in approximately 10 days. The larvae drop from the fruit and burrow two to three cm into the soil to pupate. In 10 to 12 days, the adults emerge. The newly emerged adult females need 8 to 12 days to mature sexually prior to egg laying. With an advanced infestation, breeding is continuous, with several annual generations. Adults live 90 days on the average and feed on honeydew, decaying fruit, plant nectar, bird dung and other substances. The adult is a strong flyer, recorded to travel 30 miles in search of food and sites to lay eggs. This ability allows the fly to infest new areas very quickly.

## **ERADICATION PROGRAM**

- Protecting California's environment from invasive species is the goal, and eradication via male attractant technique is the strategy.
  - Male attractant technique (MAT) is the standard treatment technique for OFF. MAT is conducted in a 1.5-mile radius from each fly find site for a minimum of 9-square-miles.
  - Approximately 600 small, gel-like "bait stations" per square mile are applied to utility poles and street trees at a height of six to eight feet. The technique is repeated every two weeks for a minimum of four applications, or one to two life cycles, depending on the severity of the infestation.
  - These bait stations contain a male attractant (methyl eugenol) that is mixed with a small amount of the pesticide Spinosad. The bait stations will attract the male fruit flies looking for an opportunity to breed. The females go unmated and no offspring are produced, effectively causing eradication of the population.
  - MAT is specific for this group of flies and will not harm other insects such as bees or butterflies.
  - If larvae, mated females, or numerous males are detected, additional ground treatments may be required to mitigate the spread of OFF. In this case, host trees and plants within a 200-meter radius of the find site are treated with a handheld hose that consists of an organic formulation of Spinosad and protein bait.

## **MORE INFORMATION IS AVAILABLE**

CDFA - [www.cdfa.ca.gov/phpps](http://www.cdfa.ca.gov/phpps)  
CDFA Pest Hotline: 800-491-1899  
APHIS/USDA - [www.aphis.usda.gov](http://www.aphis.usda.gov)

