



## The Oriental Fruit Fly Eradication Program in Miami-Dade County—Why it Worked

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In late August 2015, an unprecedented number of Oriental fruit flies (OFF) were found in the agriculturally rich area of Homestead, FL. Previous detections of this destructive pest in Florida were limited to no more than a few flies which were quickly trapped and destroyed. The number of flies found, combined with a find of live larvae in fallen fruit, prompted the Oriental Fruit Fly Eradication Program and an 85 square-mile quarantine area (which would eventually grow to 98 square miles). The Oriental fruit fly, *Bactrocera dorsalis*, is taken extremely seriously because the species has a host list of well over 400 plants, including most of the fruit and vegetables grown in Miami-Dade, as well as some ornamental plants. The quarantine began on 2 Sept. 2015, and ended on 13 Feb. 2016, after the OFF was successfully eradicated from the Homestead area. The OFF eradication program worked because it brought together the Florida Department of Agriculture and Consumer Services–Division of Plant Industry, USDA–APHIS–Plant Protection Quarantine, the University of Florida, UF/IFAS Miami-Dade County Extension, Miami-Dade County government, and the entire agricultural industry of Miami-Dade County, FL, to work toward a common goal. The collaboration and dedication of these agencies and institutions, along with the incredible response from the entire local agricultural industry and the highly effective trap and kill program used by the USDA and FDACS were crucial in eradicating the Oriental fruit fly and saving the multi-million dollar Miami-Dade County agricultural industry.

Sometime before dawn on Wednesday, 2 Sept. 2015, a fruit fly quarantine went into effect in an 85 (which would eventually grow to 98) square-mile portion of the Redland agricultural area (Fig. 1) which included packing houses, tropical fruit groves, vegetable fields, fruit stands, plant nurseries, and homes (Fig. 2). The quarantine was serious business, and a multi-million-dollar agricultural industry was at stake.

The quarantine went into effect 24 hours after a public announcement was placed in *The Miami Herald*, and was prompted by Florida Rule 5B-66, which states “State and federal agricultural officials are mandated to keep the Oriental fruit fly out of this country. Wherever Oriental fruit flies are found in the continental U.S., the pest must be eradicated.”

Tens of thousands of traps (Fig. 3) lie waiting throughout Florida at any given time with the sole purpose of alerting the Florida Department of Agriculture and Consumer Services (FDACS) to the presence of the Oriental Fruit fly and other invasive and destructive species of fruit flies.

The Oriental fruit fly, *Bactrocera dorsalis*, is taken extremely seriously because the species has a massive host list of 478 plants (most of our fruit crops and many of our fruiting vegetables and some ornamental plants that produce fruit); they are strong fliers, and one female fly lays an *average* of 600 eggs in 30 days. According to Mark Fagan, the public information specialist of the Division of Plant Industry, a specialized division within FDACS,

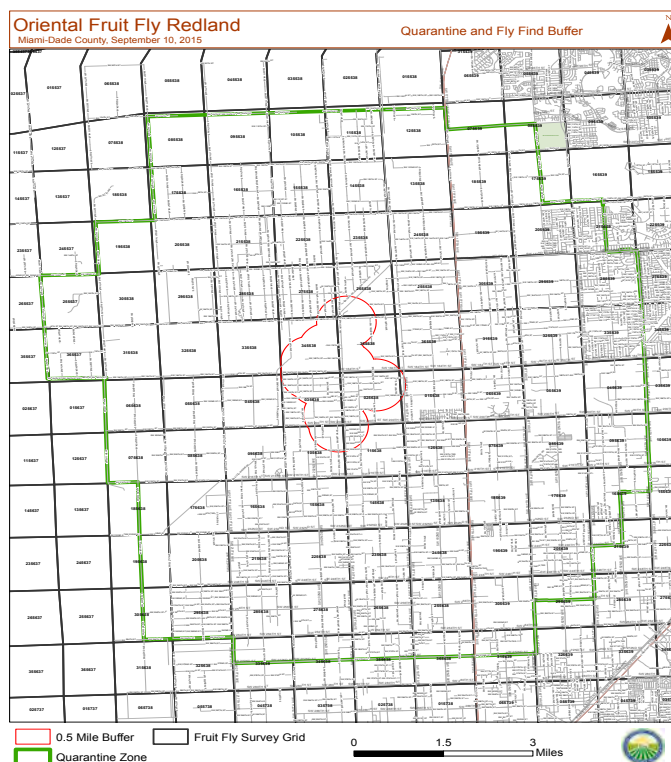


Fig. 1. A map of the quarantine area. The green line is the border of the quarantine and the area in red was where flies were found. Credit: FDAC's website.

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Fig. 2. The quarantine area housed nurseries, homes, fruit groves and vegetable fields as this aerial photo demonstrates. Photo credit: Jeff Wasielewski.



Fig. 3. Tens of thousands of fruit fly traps are found throughout the state at any given time. Photo credit: Jeff Wasielewski.

30% of females can push out a whopping 50 eggs in a single day, or 1500 eggs in 30 days.

Females lay their eggs in host fruit or vegetables, then the young hatch and feed on the fruit, effectively making the fruit impossible to sell and unpalatable. Mature larvae exit the fruit and enter the soil below them, pupate, and emerge as flies to begin the cycle yet again. This fly had the power to completely devastate the multi-million dollar agricultural industry in Miami-Dade County and trigger regulations that would cripple the industry and put thousands of jobs in jeopardy.

#### **Past finds of the Oriental fruit fly in Florida were inconsequential or easily eradicated.**

The Redland detection of 2015 was markedly different because of the extraordinary quantity of flies captured. After finding a lone male fly in a trap on 17 Aug., outside of the quarantine area, FDACS later found an alarming 45 male flies in a single trap on 28 Aug. The historic 45 fly find was located in the heart of the agricultural industry in Miami-Dade County, FL. Male flies are

the first to be captured because monitoring traps use a pheromone that tricks the males into thinking they are near a receptive female.

Homestead is an area unlike any other in the continental United States. It is home to an incredible array of tropical fruit and vegetables, with crops as well-known as avocados and squash, and as unique as sugar apples and winged beans. Vegetable fields and fruit groves are intermixed and produce crops side by side tended by people as varied and diverse as the very crops they grow. That one of a kind diversity could have been lost if the Oriental fruit fly permanently became established in Miami-Dade. It also put Florida's multi-billion dollar fruit and vegetable industry at risk.

Enhanced trapping and scouting soon turned up even more males, as well as a mango fruit infested with Oriental fruit fly larvae. Co-incident Commander Bryan Benson, of FDACS, called these finds, "an unprecedented amount of Oriental fruit flies ... with the capacity to devastate the local agricultural industry".

FDACS, the USDA-APHIS, Miami-Dade County, UF/IFAS Miami-Dade County Extension, and the UF/IFAS Tropical Research and Education Center worked together, and readily shared information and resources to educate all interested parties about the rules and effects of the quarantine.

The response from the agricultural industry was tremendous. The UF/IFAS Miami-Dade Extension office hosted ten workshops (Fig. 4) dedicated to educating the industry, with over 1000 people in attendance that came just so they could do the right thing and help to stop the fly from spreading.

#### **Quarantine Facts**

- A compliance agreement needed to be filled out and signed, in person, with FDACS regulatory staff for any fruit, vegetable growers, packers, or sellers/stands located within the quarantine area that wished to sell or move any of the 478 host plants, vegetables, or fruits during the quarantine. Parties outside of the quarantine area that wanted to move produce into the area to pack or sell, also needed to sign a compliance agreement.
- Some nurseries within the quarantine area needed to sign a compliance agreement. You could have still bought plants from these nurseries as long as the grower had signed and adhered to the compliance agreement or was selling a product that was not regulated under the quarantine (soil, mulch, rocks, fish, wood products, or any plants that were not near



Fig. 4. Florida's Commissioner of Agriculture, Adam Putnam, spoke at one of the Oriental fruit fly workshops. Photo credit: Jeff Wasielewski

or under a fruit fly host tree or have host fruit on the plant).

- Homeowners located within the quarantine zone were not able to move fruit or vegetables on the host list off of their property. They could grow and eat the produce at their home, but could not, under any circumstances, move the produce off their property until the quarantine was lifted.
- Homeowners and fruit and vegetable growers outside of the quarantine area were not affected by the quarantine and did not have to, or need to spray any additional pesticides, or bait spray. Bait pesticide sprays were part of the compliance agreement for producers within the quarantine zone or those producers outside the zone who wished to be pro-active in the event the quarantine zone was expanded to include their farms, but did not affect others, especially homeowners, and were not needed or recommended.

The rules and regulations regarding the quarantine were difficult to complete and understand, but they were necessary to stop the Oriental fruit fly from jumping out of the quarantine area and making life even harder, if not impossible, for the hardworking farmers and the agricultural community of Miami-Dade County, FL. The workshops and literature produced by the UF/IFAS Miami-Dade Extension office, UF/IFAS TREC, the USDA-APHIS and FDACS were essential components that allowed the agricultural community to comprehend and comply with the complicated rules and regulations.

The silver lining was the fact that the trap and kill program designed for the Oriental fruit fly was, in the words of DPI's Mark Fagan, "extraordinary." FDACS men and women worked seven days a week to hang baited traps, strip trees of fruit in the "hot

zone", in an effort to eradicate this destructive fly completely.

The quarantine could only end if the fruit fly traps remained empty for three full life cycles of the fly. The lifecycle fluctuates based on climatic conditions with hotter temperatures producing lifecycles around 30 days and cooler temperatures pushing the cycle nearer to 45 days.

### Success

The Oriental fruit fly quarantine that began on 2 Sept. 2015, finally ended on 13 Feb. 2016. All rules and regulations that had been put in place by the quarantine ended, and all compliance agreements were no longer needed. The last Oriental fruit fly was found on 10 Oct., 2015, with 13 Feb. 2016, marking the end of three full life cycles of the fly without finding a single Oriental fruit fly in the numerous traps strategically placed throughout the quarantine area.

The Oriental Fruit Fly Eradication Program (OFF Program) worked because it brought together the nationally recognized plant pests eradication expertise of the Florida Department of Agriculture and Consumer Services—Division of Plant Industry (FDACS-DPI) and USDA-APHIS-Plant Protection Quarantine, the UF/IFAS expertise in science-based information and outreach (extension), UF/IFAS Miami-Dade County Extension expertise in providing timely science-based information and Miami-Dade County government's cooperation to assist the multi-million dollar Miami-Dade County agricultural industries. The collaboration and dedication of these agencies and institutions, along with the agricultural industries of Miami-Dade County, FL, allowed the Oriental fruit fly eradication effort to be a success.