

2023 Oriental Fruit Fly Response – Fountain Valley, Orange County
AP23PPQFO000C409 Annual Accomplishment Report

Year:	2023
State:	California
Cooperative Agreement Name:	Oriental Fruit Fly Eradication Project – Fountain Valley, Santa Orange County
Cooperative Agreement Number:	FAIN: AP23PPQFO000C409
Project Funding Period:	October 01, 2022, to August 30, 2023
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Quarterly Accomplishment Report	☐
Semi-Annual Accomplishment Report	☐
Final Accomplishment Report	☒

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A. Background

Between August 15, 2022 and January 4, 2023, 21 adult Oriental Fruit Flies (OFF) and 4 larvae were detected in Orange County, California. In response to these detections, the California Department of Food and Agriculture (CDFA) implemented a delimitation trapping project. Additionally, the CDFA and the United States Department of Agriculture (USDA) implemented larval survey, insecticide treatments, host fruit removal and quarantine enforcement. This program increases the likelihood that the OFF will be eradicated from California. A quarantine was initiated on September 16, 2022 encompassing 100 square miles in Fountain Valley, Orange County and the surrounding areas. This report contains information from the inception of this project through August 30th, 2023.

The establishment of OFF would have a dramatic impact on the environment and economic wellness of California and the nation. OFF in California would require extensive use of pesticides both in urban and commercial settings. The resulting quarantines against exported California grown commodities would have an immediate impact on California's ability to compete in the international export trade arena. These infestations pose a serious threat to the United States' agricultural industry, particularly to California's \$55.9 billion agricultural industry.

In accordance with the Food and Agricultural Code, Sections 24.5, 403, 5006, 5301, 5322 and 5721, the CDFA is legislatively mandated to “protect California from the damage caused by the introduction or spread of harmful plant pests.” Because California’s climate will support a continuous breeding population, it is likely that OFF will establish a permanent presence in the state if new infestations are not eradicated. To minimize the statewide impact of the OFF, the CDFA must implement intensive trapping, conduct larval surveys, apply pesticides, and regulate the movement of hosts within the quarantine zone to achieve eradication. The objective of California's eradication activities will be to continue early detection of new OFF infestations and the subsequent eradication of these infestations to protect California’s urban and natural environments.

B. Activities

Monthly activities:

October 1, 2022 – Conduct delimitation trapping, larval survey, initiate ground treatments, initiate Male Attractant Treatment (MAT), conduct fruit removal and enforce quarantine regulations. Train personnel, obtain supplies needed for field activities. Solicit and evaluate prospective seasonal employees, hire and provide training to seasonal personnel.

February, 2023 – Discontinue foliar bait treatments.

July, 2023 – Discontinue MAT.

July-August 2023 - Continue to enforce quarantine regulations. Maintain delimitation traps to protocol density for one additional life cycle.

August 19, 2023 – Declare eradication in Orange County.

August 20 to December 31, 2023 – Work activities related to preparation of reports and billing.

1. Detection

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Table 1: Fountain Valley and Surrounding Area Detection Activity- Orange County

Find Site #	Detection Date	PDR #	Address City	Host	Identification			Notes	TrapType
					Male	Female	Molecular ID		
1	8/15/22	AH0P06298520	[REDACTED]	Fig	1	0	C3pX349		Jackson
2	9/6/22	AH0P06298523	[REDACTED]	Guava	1	0	C3pl058		Jackson
3	9/7/22	AH0P06298525	[REDACTED]	Jujube	1	0	C3pl058		Jackson
4	9/8/22	AH0P06298587	[REDACTED]	Rose Apple	0	1	C3px410	Unmated female, no eggs present	McPhail
3	9/9/22	AH0P06298588	[REDACTED]	Guava	0	1	C3pl058	Unmated female, no eggs present	McPhail
2	9/9/22	AH0P06298589	[REDACTED]	Guava	1	0	C3pl058	Very fresh specimen, vibrant color in eyes and thorax	Jackson
3	9/12/22	AH0P06298591	[REDACTED]	Jujube	1	0	C3pl058		Jackson
5	9/12/22	AH0P06298592	[REDACTED]	Persimmon	1	0	C3px410		Jackson
6	9/21/22	AM0P50056021	[REDACTED]	Pomelo	-	-	C3pl058	4 larvae were collected from inside the 200-meter larval survey area	Visual Survey
7	9/22/22	AH0P06298607	[REDACTED]	Persimmon	0	1	C3pl058	Unmated female, eggs nearly completely developed	McPhail
1	9/22/22	AH0P06298608	[REDACTED]	Fig	1	0	C3pl058		Jackson
2	9/22/22	AH0P06298609	[REDACTED]	Guava	1	0	C3pl058		Jackson
7	9/26/22	AH0P06298610	[REDACTED]	Persimmon	0	1	C3pl058	Unmated female, eggs nearly completely developed	McPhail
6	9/26/22	AH0P06298611	[REDACTED]	Persimmon	1	0	C3pl058		Jackson
2	9/27/22	AH0P06298493	[REDACTED]	Guava	2	0	C3pl058		Jackson
8	9/28/22	AH0P06298612	[REDACTED]	Pummelo	0	1	C3pX403	Unmated female, eggs starting to develop	McPhail
2	9/30/22	AH0P06298594	[REDACTED]	Guava	1	0	C3pl058		Jackson
2	10/7/22	AH0P06298596	[REDACTED]	Guava	1	0	C3pl058		Jackson
2	10/18/22	AH0P06298597	[REDACTED]	Guava	1	0	C3pl058	Specimen crushed into pieces	Jackson
9	10/26/22	AH0P06298613	[REDACTED]	Tangerine	1	0	C3pMS411		McPhail
6	01/04/23	AH0P06298598	[REDACTED]	Lemon	1	0	C3pl058		Jackson
Table 1 Totals					16	5			

a. Life Cycles

The following life cycle projections are based on the male found on January 4, 2023:

- F1: 05/02/23*
- F2: 07/08/23*
- F3: 08/19/23*

b. Trapping Activities

Following detection of the OFFs detected between August 15, 2022-January 1, 2023, the CDFA extended the duration and expanded the area of a delimitation trapping

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project that was already in place following the detection of four adult OFF between July 26 and August 1, 2022. Following confirmation of the specimens, trap densities in the core square mile(s) were increased within 24 hours. Traps in the core were inspected daily during the first week. Traps in the first buffer zone were serviced every two days, those in the remainder of the delimitation area were checked at least once during the first week. Starting the week of December 12, 2022 all traps were serviced weekly. Delimitation trapping ended on August 19, 2023 after three fly generations passed beyond the date of the last fly detected. This time period was determined by a temperature-dependent developmental model run by the Pest Detection/Emergency Projects (PD/EP) Branch personnel in Sacramento. All traps related to this project were removed by August 25, 2023. Some traps still remained in the surrounding/overlapping areas with ongoing delimitation projects after the conclusion of this project.

Traps were placed over a 4.5-mile radius area centered on each detection site. Delimitation traps in the core were Jackson traps baited with methyl eugenol and Dibrom and McPhail traps baited with torula yeast and borax. The remainder of the delimitation area was surveyed with Jackson traps baited with methyl eugenol and Dibrom. Additional traps were added as needed to further delimit the infestation and to determine the efficacy of treatments. Traps were relocated to available preferred hosts as practical. Quality control inspections were conducted, and all trap inserts were reviewed a second time to confirm the absence of OFF before they were discarded.

Table 2: Delimitation Trapping Activity

County	City	Project Name	Delimitation Area Square Miles	Number of Traps Deployed	
				OF Jackson	McPhail
Orange	Fountain Valley	Fountain Valley- OFF	~100	466	97

c. Larval Survey

Fruit on properties where OFF were trapped was inspected for possible larval infestation. Within a 200-meter radius of each detection site, preferred host plants with fruit were inspected for OFF eggs or larvae. Fruit being sampled include citrus, peaches, figs, apples, guavas, tomatoes, peppers, and other OFF hosts. The larval survey was completed on November 21, 2022. Areas 5, 6, 7, 8, 10 and 11 were not 100% surveyed due to issues getting access to properties.

Table 3: Larval Survey Activity

County	Survey Area Meters	Area #	Larval Survey Area	Properties cut	Pounds of Fruit Cut (lbs.)	% Complete	Date Completed
Orange	200	4		7	21.25	100	9/22/22
Orange	200	5		99	558.5	94.71	11/21/22
Orange	200	6		74	555	96.49	11/21/22
Orange	200	7		51	336.5	95.24	11/21/22
Orange	200	8		85	488.75	97.93	11/21/22
Orange	200	9		69	704	100	11/21/22

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Orange	200	10		173	616.25	98.59	11/21/22
Orange	200	11		88	629.75	96.61	11/21/22
Table Total				646	3910	-	-

2. ERADICATION

a. Male Attractant Treatment (MAT)

Male Attractant Treatment (MAT): This method relies on applying bait stations in order to kill males when they become sexually mature and are ready to mate. This technique is used in conjunction with ground bait sprays used to kill existing fertile wild OFFs. MAT treatment began on August 17, 2022, and was applied every two weeks for two life cycles past the date the last fly was detected. The treatment area was nine square miles around each detection site. The final MAT treatment was completed on July 13, 2023.

Table 4: MAT Activity

County	Project Name	MAT				
		Square Miles	# of Bait Stations	# of Application	First Application	Final Application
Orange	Fountain Valley OFF	18.10	1721	1	8/17/22	8/23/22
			3879	2	8/30/22	9/13/22
			5139	3	9/13/22	9/26/22
			5855	4	9/26/22	10/14/22
			6564	5	10/25/22	11/30/22
			6034	6	11/30/22	12/14/22
			6312	7	12/15/22	1/13/23
			6547	8	1/13/23	1/27/23
			6565	9	1/27/23	2/17/23
			6385	10	2/17/23	3/27/23
			5615	11	3/27/23	4/18/23
			6437	12	4/18/23	5/3/23
			7434	13	5/2/23	5/17/23
			7591	14	5/17/23	6/22/23
			5847	15	6/23/23	7/13/23

b. Foliar bait treatments

Ground Bait Spray: GF-120 NF Naturalyte, containing spinosad and bait, was applied to all properties within a 200-meter radius of each fly detection site within the eradication area for one lifecycle and concluded on May 4, 2023. Treatments were repeated at seven to 14-day intervals. Residents in affected areas were notified in writing at least 48 hours prior to any insecticidal treatments.

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Table 5: Foliar Bait Treatment Activity

County	<i>Foliar Bait GF-120 Spinosad</i>							
	*Find Site #	Area #	# of properties	# of Properties Treated	Refusals/ week	Number of Application	First Application	Final Application
Orange	1	FV4	130	97	3 - 46	28	9/22/22	5/4/23
	3	FV5	166	123	6 - 12	10	9/22/22	12/1/22
	4	FV6	107	87	3 - 9	8	9/23/22	11/14/22
	5	FV7	84	65	3 - 7	7	9/23/22	11/4/22
	8	FV8	137	92	0 - 7	10	9/27/22	12/1/22
	8	FV9	101	72	1 - 6	6	10/21/22	11/30/22
	6	FV10	420	249	6 - 76	23	10/19/22	5/4/23
	9	FV11	111	103	5 - 16	12	10/31/22	2/9/23
Total	-	-	1256	888	-	-	-	-

c. Fruit Removal

Fruit Removal is done to prevent the artificial movement of potentially infested fruit from the quarantine area and eliminate immature life stages before they can complete development. Fruit removal occurs when there is evidence of a breeding population. Fruit removal started on September 9, 2022 and was completed on December 28, 2022 after fruit was removed from the remaining four refusal properties.

Block #	Total Properties	Properties Removed	No Host	Host/No Fruit	Pending/ No-Contact	Refusals	Pounds Removed
FV_FR1	22	19	2	1	0	0	2121.5
FV_FR2	19	14	5	0	0	0	1050.75
FV_FR3	28	22	4	2	0	0	1039.25
FV_FR4	28	20	3	1	0	4	1760
FV_FR5	27	22	3	2	0	0	2021.25
FV_FR6	3	0	3	0	0	0	0
FV_FR7	20	1	9	10	0	0	60
FV_FR8	6	0	3	3	0	0	0
Total:	153	98	32	19	0	4	8052.75

3. REGULATORY

The OFF quarantine was initiated on September 16, 2022. A quarantine area of 100 square miles was established in Fountain Valley, Orange County, and its surrounding areas. The quarantine was concluded on August 19, 2023.

Table 6: Regulatory Activity

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Regulatory Activity	Cumulative Total
Hold Notices issued – Fly Find Sites	9
Hold Notices Issued – Establishments	38
Regulatory Visits – All Establishments	2854
Compliance Agreements Issued – All Establishments	225
Exhibit issued to Growers	5
Exhibit issued to Harvesters	5
Exhibit issued to Transporters	4
Exhibit issued to Fruit Sellers	150
Exhibit issued to Plant Sellers	66
Community Garden	1
Food Bank	1
Distributor/Wholesaler	7
Warnings Issued for non-compliance	49
Notices of Violation Issued for non-compliance	2
Lbs. of FFHM Surrendered by establishments	9064
Pounds of FFHM Seized for Non-compliance	180
Number of Growers pre-harvest treating	4
Number of Grower pre-harvest treatments conducted	124

Summary

- A total of 2,854 regulatory visits were conducted and 225 compliance agreements issued.
- A total of 49 warnings were issued and 2 Notices of Violation were issued for non-compliance.
- A total of 9,244 pounds of Fruit Fly Host Material was surrendered or seized.

The establishments with agreements were routinely monitored for compliance with quarantine regulations. Regulatory enforcement was conducted seven days a week for the duration of the quarantine.

4. TAXONOMIC SUPPORT

The diagnostic services of the CDFA Plant Pest Diagnostic Center were utilized for all diagnostic identifications.

5. DATA

Data from detections were entered into the CDFA Pest and Damage Record database and shared with the USDA. The number of insect samples submitted which were identified as OFF is summarized in Table 1. No samples were submitted that turned out to be negative. The number of traps deployed is summarized in Table 2 of this report. Additional treatment, eradication and regulatory data were also collected and are summarized in the tables above. All data were shared with the USDA APHIS. Inventory of all supplies was taken and replenished.

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Approved and signed by:

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