

# Navel Orangeworm Program 2023 – Weekly Report

Week Ending – October 13, 2023

California Department of Food & Agriculture  
Plant Health and Pest Prevention Services  
Integrated Pest Control Branch  
5100 Douglas Avenue  
Shafter, CA 93263  
Phone: (661) 395-2914  
Fax: (661) 399-1601

## I. Program Updates

### Navel Orangeworm Area Wide Program – Multi-Phase Approach

#### Phase 1 – 2018-2022

Phase 1 was the Initial Phase of the Navel Orangeworm (NOW) Program (Program) with a focus on developing NOW sterile insect technique (SIT) moths, determining their viability during cold storage transfer, performing quality control (QC) on mating propensity and survivability of the sterile moths, developing a trap monitoring program, and collecting preliminary damage data from the orchards participating in the Program's project site.

#### Phase 2 – 2023

Phase 2 is the Data Phase of the NOW Program. The focus of this phase is controlling variables within the orchards participating in the Program's project site in order to increase the integrity of the field data being collected. During this phase a University of California Cooperative Extension (UCCE) coordinator will take over as a grower point of contact. They will be responsible for coordinating with growers and establishing orchards for the Phase 2 Program project site.

### Navel Orangeworm Sterile Insect Technique

The Navel Orangeworm Program utilizes NOW SIT moths obtained from the United States Department of Agriculture (USDA) and California Department of Food and Agriculture's (CDFA) Phoenix, Arizona Rearing Facility. QC tests are performed on every shipment of NOW SIT moths used for aerial releases.

Aerial releases for 2023 began on Sunday, March 12, with one magazine of approximately 750,000 moths being released daily over two 640-acre orchards in Fresno County, designated as Zones 1 and 3. Beginning on Thursday, April 13, a second magazine of approximately 750,000 moths began being released daily over a single 640-acre orchard, designated as Zone 6. During the period of April 18 to April 23, the second magazine was released daily over two 640-acre orchards, designated as Zones 6 and 7. As of Monday, April 24, the second magazine began being released daily over two 640-acre orchards, designated as Zones 4 and 6. During select days each week, magazines are diverted to separate sites for research purposes.

Ground releases are conducted in lieu of aerial releases only when aerial releases are not possible. Ground releases are limited to one magazine released at one zone per day, along the north and west edges of the release zone.

Listed below are any circumstances which prevented regular releases in 2023:

March 10: No release conducted due to excessive rain preventing access to release sites via air or ground; moth shipment from March 9 held overnight for a second night for potential release on March 11

March 11: No release conducted due to excessive rain preventing access to release sites via air or ground; moth shipment from March 9 was destroyed; moth shipment from March 10 held overnight for a second night for potential release on March 12

March 12: Double release conducted over Zones 1 and 3 with moth shipments from March 10 and 11

March 14: No release conducted due to excessive rain preventing access to release sites via air or ground; moth shipment from March 13 held overnight for a second night for potential release on March 15

March 15: Double release conducted over Zones 1 and 3 with moth shipments from March 13 and 14

March 17: No release conducted due to mechanical issues with release aircraft; moth shipment from March 16 held overnight for a second night for potential release on March 18

March 18: Double release conducted over Zones 1 and 3 with moth shipments from March 16 and 17

April 20: First magazine unintentionally released over Zones 1 and 7 instead of Zones 1 and 3; the second magazine released, per schedule, over Zones 6 and 7

May 10: Ground release conducted at Zone 1 using Mag 1 while release aircraft underwent repairs; Mag 2 from May 9 held overnight for a second night for potential release on May 11; only one magazine transferred through airline for potential release on May 11

May 11: Aerial releases conducted per schedule; Mag 2 from May 9 released over Zones 4 and 6

May 30: Only Mag 1 shipped through airline due to issue at rearing facility

May 31: Single aerial release conducted using Mag 1 over Zones 1 and 3 only

June 6: No shipments sent through airline due to airline flight cancellations

June 7: No releases due to airline flight cancellations from previous day

June 13: No shipments sent through airline due to airline flight cancellations

June 14: No releases due to airline flight cancellations from previous day

June 18: No shipments received; shipments placed on incorrect flight

June 19: No releases due to shipments being placed on incorrect flight on previous day

June 20: No shipments sent through airline due to airline flight cancellations

June 21: No releases due to airline flight cancellations from previous day

June 26: Single ground release conducted at Zone 4 using Mag 2 from June 25 while release aircraft underwent repairs; Mag 1 from June 25 held overnight for potential release on June 27

June 27: Single ground release conducted at Zone 1 using Mag 1 from June 25 while release aircraft underwent repairs; both mags from June 26 held overnight for potential release on June 28; no shipments sent through airlines

June 28: Single ground release conducted at Zone 4 using Mag 2 from June 26; no shipments sent through airlines due to issue at rearing facility; Mag 1 from June 26 destroyed at Shafter facility

June 29: No releases; shipments not sent through airlines due to issue at rearing facility

June 30: No releases; shipments not sent through airlines due to issue at rearing facility

July 3: No shipments sent through airline due to airline flight cancellations

July 4: No releases due to airline flight cancellations from previous day; no shipments sent through airlines

July 5: No releases due to airline flight cancellations from previous day

July 27: No releases due to cold room malfunction at Shafter facility causing high mortality rates in magazines of moths

August 9: Single ground release conducted at Zone 4 using Mag 2 while aircraft underwent repairs

August 17: Single ground release conducted at Zone 6 using Mag 2 while aircraft underwent repairs

August 21: No releases due to hurricane weather; both mags from August 20 held overnight for potential release on August 22

August 22: Double aerial releases using both mags from August 20

September 11: Single aerial release conducted; Mag 2 released over Zones 4 and 6; Mag 1 not released due to issue with release equipment

September 30: Single aerial release conducted; Mag 2 released over Zones 4 and 6; Mag 1 not released due to issue with release aircraft

October 1: No releases due to issues with release aircraft

October 4: Single aerial release conducted; Mag 2 released over Zones 4 and 6; Mag 1 not released due to issue with release aircraft

October 5: No shipments sent through airline due to airline flight cancellations

October 6: No releases due to airline flight cancellations from previous day

October 12: Single aerial release conducted; Mag 2 released over research sites; Mag 1 not released due to issue with release aircraft

### **Navel Orangeworm Trapping**

During Phase 1 of the NOW Program, trap monitoring operations began May 5, 2020, with an area wide project site that included a total of four orchards in Fresno County: two 640-acre almond orchards and two 640-acre pistachio orchards. On May 17, 2021, the Area Wide Project site expanded to include four additional orchards in Fresno County: one 640-acre almond orchard, one 640-acre pistachio orchard, one 160-acre almond orchard, and one 160-acre pistachio orchard. All eight orchards, designated as Zones 1 through 8, were serviced on a weekly basis.

For Phase 2 of the NOW Program, the area wide project site will include eight 640-acre orchards; four pistachio and four almond, located in Fresno County. All eight orchards, designated as Zones 1 through 8, have been identified. Trapping is being conducted weekly in Zones 1 through 8.

Listed below are any circumstances which prevented regular trap servicing in 2023:

- Week of March 3: No traps were serviced due to excessive rain preventing access to trap sites
- Week of March 17: Only Zone 1 traps were serviced; Zones 2 - 6 traps not serviced due to excessive rain preventing access to trap sites
- Week of March 24: Only Zone 1 traps were serviced; Zones 2 - 6 traps not serviced due to excessive rain preventing access to trap sites

- Week of March 31: No traps were serviced in Zone 2 due to excessively muddy conditions preventing access to trap sites; trap sites 26 – 36 in Zone 4 were not serviced due to pesticide applications on site
- Week of May 5: No traps were serviced in Zone 7 due to excessively muddy conditions preventing access to trap sites
- Week of May 12: No traps were serviced in Zones 2 and 5 due to pesticide applications on site
- Week of June 9: No traps were serviced in Zone 2 due to pesticide applications on site
- Week of June 23: Trap sites 20 – 36 not serviced in Zone 3 due to pesticide applications on site; Trap sites 10 – 36 not serviced in Zone 6 due to pesticide applications on site
- Week of June 30: No traps were serviced in Zone 8 due to pesticide applications on site
- Week of July 7: Trap sites 17 – 36 not serviced in Zone 6 due to pesticide applications on site; No traps were serviced in Zone 7 due to staff shortage; No traps serviced in Zone 8 due to pesticide applications on site
- Week of July 28: No traps were serviced in Zones 2 and 8 due to pesticide applications on site
- Week of August 11: Trap sites 19 – 36 not serviced in Zone 4 due to pesticide applications on site; No traps were serviced in Zone 7 due to pesticide applications on site
- Week of August 18: No traps were serviced in Zones 4 and 8 due to pesticide applications on site
- Week of August 25: No traps were serviced in Zones 4 and 5 due to staffing issues
- Week of September 15: No traps were serviced in Zone 6 due to pesticide applications on site

## II. Project Design

The 2023 Area Wide Project site is being restructured in preparation for Phase 2 of the Program, which will establish more standardized and consistent approaches to mating disruption, sanitation, pesticide usage, and other cultural practices for more comparable data between each orchard set (release site/control site).

Listed below is information related to each orchard within the Program's Phase 2 project site for 2023:

Zone #	Crop Type	Acres	Release/Non-release Site	Magazine Designation	Date Added to Area Wide Project
Zone 1	Pistachio	640	Release	Mag 1	February 2023
Zone 2	Pistachio	640	Non-release		February 2023
Zone 3	Almond	640	Release	Mag 1	February 2023
Zone 4	Almond	640	Release	Mag 2	February 2023
Zone 5	Pistachio	640	Non-release		March 2023
Zone 6	Pistachio	640	Release	Mag 2	March 2023
Zone 7	Almond	640	Non-release		April 2023
Zone 8	Almond	640	Non-release		April 2023

Each zone has a trap site ratio of approximately 1 trap site per 18 acres for a total of 36 trap sites for each 640-acre zone. Each trap site has one trap baited with pistachio meal bait and one trap baited with NOW pheromone/PPO lures. All traps are serviced on a weekly basis. Servicing includes collecting trap bottoms and replacing with new trap bottoms. Bait/lure changes occur once a month, and trap tops are replaced as needed. Counts are performed on each trap collected to determine number of wild versus sterile captures and male versus female captures.

### III. Trap Results for Week Ending on October 13, 2023

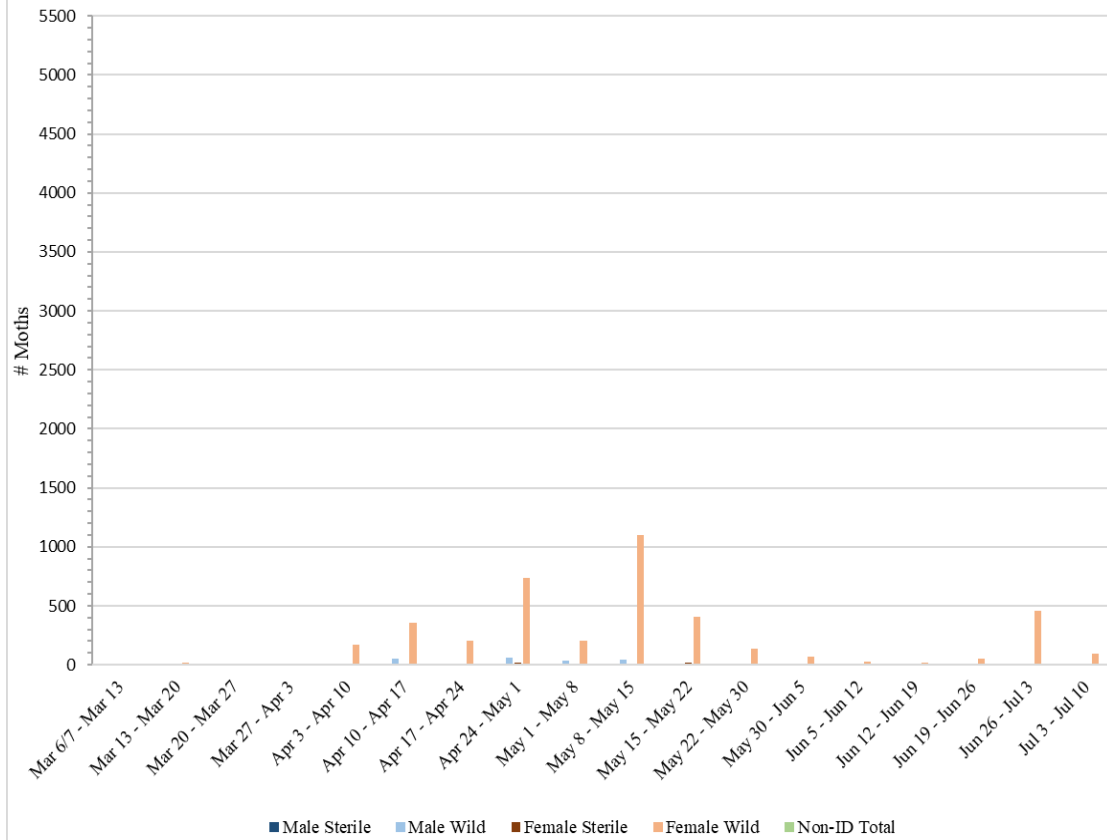
#### Zone 1 – Pistachio Orchard

A total of **36** pheromone/PPO lure-baited traps were collected from Zone 1 on Monday, October 9.

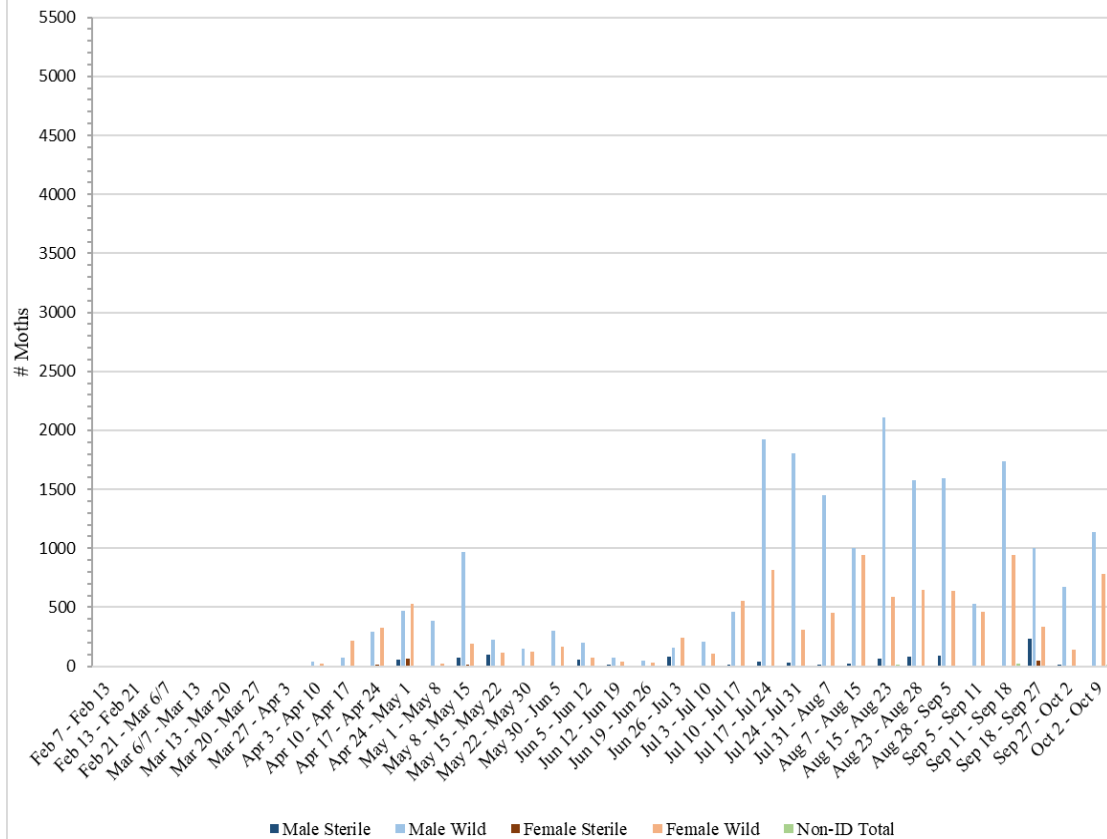
Zone 1 – Pistachio								
Meal Baited Traps								
Dates Traps in Field	# of Releases During Trap Period	Male Sterile	Male Wild	Male Total	Female Sterile	Female Wild	Female Total	Non-ID Total
<sup>2</sup> Mar 6/7 – Mar 13	2	0	0	0	1	1	2	0
Mar 13 – Mar 20	8	0	6	6	0	14	14	0
Mar 20 – Mar 27	8	0	0	0	1	0	1	0
Mar 27 – Apr 3	8	0	1	1	0	0	0	0
Apr 3 – Apr 10	8	0	13	13	0	174	174	0
Apr 10 – Apr 17	8	3	51	54	12	352	364	1
Apr 17 – Apr 24	8	0	0	0	1	206	207	0
Apr 24 – May 1	8	0	59	59	16	740	756	0
May 1 – May 8	8	0	35	35	1	206	207	0
May 8 – May 15	8	3	43	46	12	1101	1113	2
May 15 – May 22	8	0	1	1	15	406	421	1
May 22 – May 30	9	1	7	8	1	138	139	1
May 30 – Jun 5	7	1	3	4	0	70	70	0
Jun 5 – Jun 12	7	0	0	0	0	24	24	0
Jun 12 – Jun 19	6	1	1	2	2	22	24	0
Jun 19 – Jun 26	5	0	7	7	0	55	55	0
Jun 26 – Jul 3	4	3	2	5	7	456	463	3
<sup>3</sup> Jul 3 – Jul 10	6	0	2	2	2	96	98	1
<sup>2</sup> Traps 1-18 placed on March 6; Traps 19-36 placed on March 7								
<sup>3</sup> All meal traps removed from Zone 1 on July 10								

Zone 1 - Pistachio								
Pheromone/PPO Lure Baited Traps								
Dates Traps in Field	# of Releases During Trap Period	Male Sterile	Male Wild	Male Total	Female Sterile	Female Wild	Female Total	Non-ID Total
Feb 7 - Feb 13	0	0	0	0	0	0	0	0
Feb 13 - Feb 21	0	0	0	0	0	0	0	0
Feb 21 - Mar 6/7	0	0	0	0	0	0	0	0
Mar 6/7 - Mar 13	2	0	0	0	1	0	1	0
Mar 13 - Mar 20	8	0	7	7	1	1	2	0
Mar 20 - Mar 27	8	0	1	1	0	2	2	0
Mar 27 - Apr 3	8	0	2	2	0	0	0	0
Apr 3 - Apr 10	8	3	37	40	0	19	19	0
Apr 10 - Apr 17	8	0	72	72	0	220	220	0
Apr 17 - Apr 24	8	5	296	301	10	325	335	8
Apr 24 - May 1	8	52	468	520	63	528	591	7
May 1 - May 8	8	0	383	383	0	21	21	0
May 8 - May 15	8	72	967	1039	14	187	201	4
May 15 - May 22	8	95	225	320	5	117	122	5
May 22 - May 30	9	2	147	149	0	121	121	1
May 30 - Jun 5	7	5	303	308	0	168	168	1
Jun 5 - Jun 12	7	54	201	255	1	73	74	0
Jun 12 - Jun 19	6	14	72	86	8	42	50	1
Jun 19 - Jun 26	5	5	51	56	7	34	41	0
Jun 26 - Jul 3	4	80	160	240	4	244	248	7
Jul 3 - Jul 10	6	4	205	209	0	108	108	0
Jul 10 - Jul 17	8	11	458	469	0	558	558	0
Jul 17 - Jul 24	8	40	1920	1960	0	812	812	1
Jul 24 - Jul 31	7	31	1805	1836	0	310	310	5
Jul 31 - Aug 7	7	15	1447	1462	3	451	454	1
Aug 7 - Aug 15	9	23	999	1022	8	940	948	0
Aug 15 - Aug 23	7	66	2107	2173	1	587	588	11
Aug 23 - Aug 28	6	77	1573	1650	0	643	643	1
Aug 28 - Sep 5	8	87	1594	1681	1	642	643	0
Sep 5 - Sep 11	6	1	529	530	0	457	457	0
Sep 11 - Sep 18	6	5	1735	1740	0	941	941	19
Sep 18 - Sep 27	9	233	1005	1238	48	336	384	5
Sep 27 - Oct 2	3	12	675	687	3	141	144	4
<b>Oct 2 - Oct 9</b>	<b>6</b>	<b>0</b>	<b>1141</b>	<b>1141</b>	<b>0</b>	<b>779</b>	<b>779</b>	<b>11</b>
<sup>1</sup> No traps were serviced in Zone 1 during the week of March 3 due to excessive rain preventing access								
<sup>2</sup> Traps 1-18 serviced/placed on March 6; Traps 19-36 serviced/placed on March 7								

### Zone 1 - Pistachio Orchard - Meal Baited Traps



### Zone 1 - Pistachio Orchard - Pheromone/PPO Baited Traps



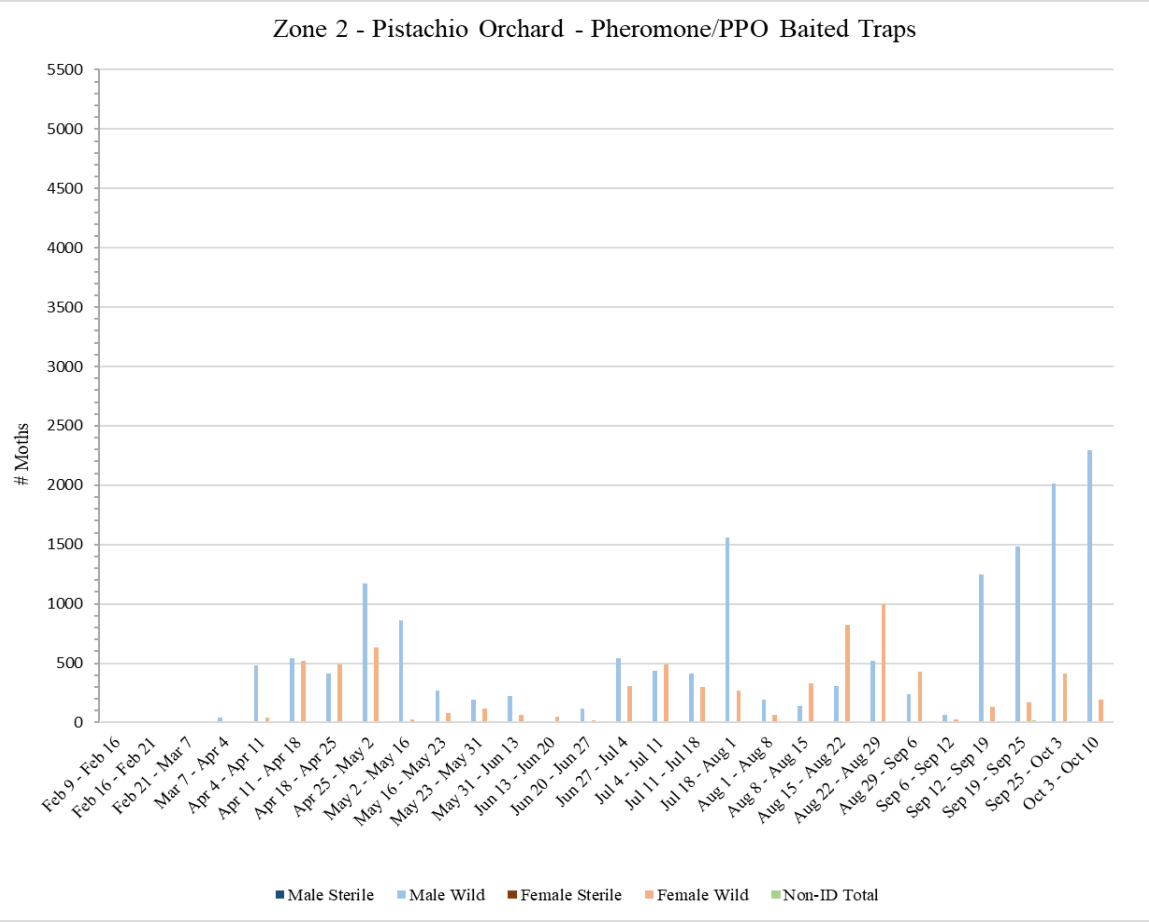
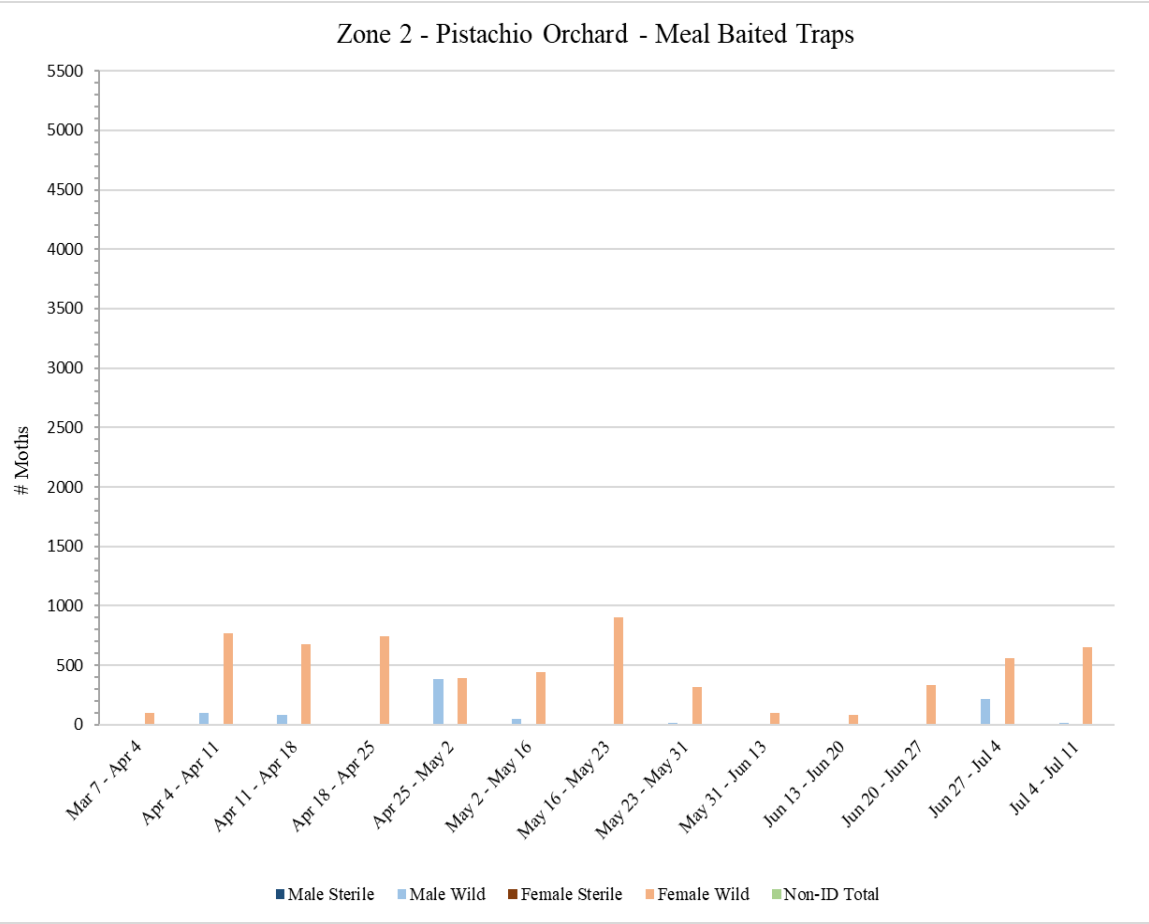
## Zone 2 – Pistachio Orchard

A total of **36** pheromone/PPO lure-baited traps were collected from Zone 2 on Tuesday, October 10.

Zone 2 - Pistachio								
Meal Baited Traps								
Dates Traps in Field	# of Releases During Trap Period	Male Sterile	Male Wild	Male Total	Female Sterile	Female Wild	Female Total	Non-ID Total
<sup>2</sup> Mar 7 – Apr 4	0	0	6	6	0	97	97	0
Apr 4 – Apr 11	0	0	102	102	0	765	765	0
Apr 11 – Apr 18	0	0	81	81	0	674	674	0
Apr 18 – Apr 25	0	0	0	0	0	744	744	6
Apr 25 – May 2	0	4	382	386	6	392	398	5
<sup>3</sup> May 2 – May 16	0	0	51	51	0	441	441	2
May 16 – May 23	0	0	4	4	0	900	900	0
May 23 – May 31	0	0	11	11	0	317	317	0
<sup>4</sup> May 31 – Jun 13	0	0	7	7	0	97	97	0
Jun 13 – Jun 20	0	0	0	0	1	80	81	0
Jun 20 – Jun 27	0	0	5	5	0	331	331	0
Jun 27 – Jul 4	0	0	214	214	0	558	558	0
<sup>5</sup> Jul 4 – Jul 11	0	0	15	15	0	651	651	3
<sup>2</sup> No traps were serviced in Zone 2 during the weeks of March 17, March 24, and March 31 due to excessive rain and muddy conditions preventing access								
<sup>3</sup> No traps were serviced in Zone 2 during the week of May 12 due to pesticide applications on site								
<sup>4</sup> No traps were serviced in Zone 2 during the week of June 9 due to pesticide applications on site								
<sup>5</sup> All meal traps removed from Zone 2 on July 11								



Zone 2 - Pistachio								
Pheromone/PPO Lure Baited Traps								
Dates Traps in Field	# of Releases During Trap Period	Male Sterile	Male Wild	Male Total	Female Sterile	Female Wild	Female Total	Non-ID Total
Feb 9 - Feb 16	0	0	0	0	0	0	0	0
Feb 16 – Feb 21	0	0	0	0	0	0	0	0
<sup>1</sup> Feb 21 – Mar 7	0	0	0	0	0	0	0	0
<sup>2</sup> Mar 7 – Apr 4	0	0	38	38	0	9	9	0
Apr 4 – Apr 11	0	0	482	482	0	44	44	0
Apr 11 – Apr 18	0	0	542	542	0	521	521	0
Apr 18 – Apr 25	0	1	413	414	0	487	487	6
Apr 25 – May 2	0	0	1168	1168	0	630	630	6
<sup>3</sup> May 2 – May 16	0	0	860	860	0	23	23	1
May 16 – May 23	0	0	269	269	0	81	81	0
May 23 – May 31	0	0	196	196	0	115	115	0
<sup>4</sup> May 31 – Jun 13	0	0	221	221	0	64	64	1
Jun 13 – Jun 20	0	0	10	10	0	45	45	0
Jun 20 – Jun 27	0	0	120	120	0	22	22	2
Jun 27 – Jul 4	0	0	543	543	0	303	303	6
Jul 4 – Jul 11	0	0	435	435	0	492	492	4
Jul 11 – Jul 18	0	0	410	410	0	302	302	0
<sup>6</sup> Jul 18 – Aug 1	0	0	1557	1557	0	265	265	11
Aug 1 – Aug 8	0	0	191	191	0	64	64	0
Aug 8 – Aug 15	0	0	139	139	0	331	331	0
Aug 15 – Aug 22	0	0	304	304	0	822	822	0
Aug 22 – Aug 29	0	0	517	517	0	994	994	1
Aug 29 – Sep 6	0	0	240	240	0	428	428	1
Sep 6 – Sep 12	0	0	61	61	0	24	24	0
Sep 12 – Sep 19	0	0	1246	1246	0	129	129	2
Sep 19 – Sep 25	0	0	1482	1482	0	171	171	18
Sep 25 – Oct 3	0	0	2016	2016	0	416	416	14
<b>Oct 3 – Oct 10</b>	<b>0</b>	<b>0</b>	<b>2295</b>	<b>2295</b>	<b>0</b>	<b>189</b>	<b>189</b>	<b>8</b>
<sup>1</sup> No traps were serviced in Zone 2 during the week of March 3 due to excessive rain preventing access								
<sup>2</sup> No traps were serviced in Zone 2 during the weeks of March 17, March 24, and March 31 due to excessive rain and muddy conditions preventing access								
<sup>3</sup> No traps were serviced in Zone 2 during the week of May 12 due to pesticide applications on site								
<sup>4</sup> No traps were serviced in Zone 2 during the week of June 9 due to pesticide applications on site								
<sup>6</sup> No traps were serviced in Zone 2 during the week of July 28 due to pesticide applications on site								

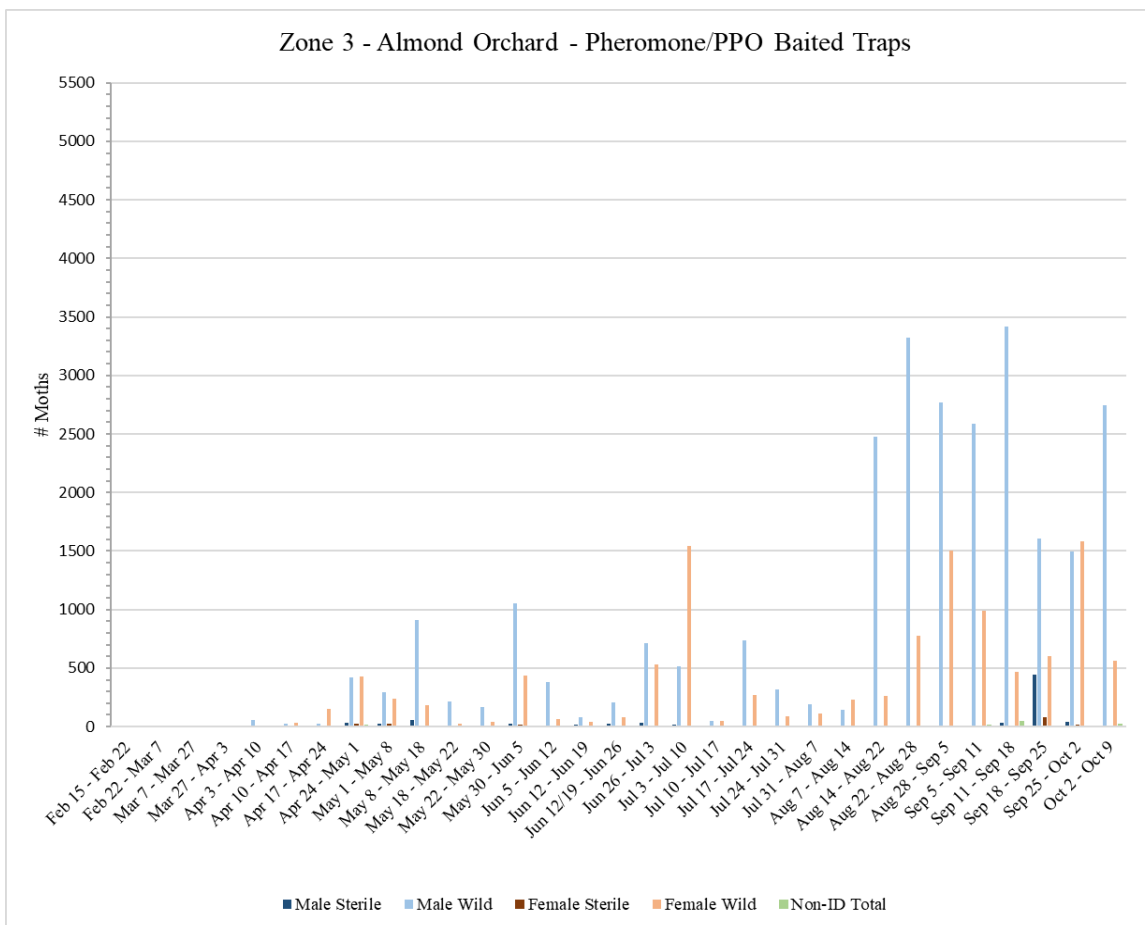
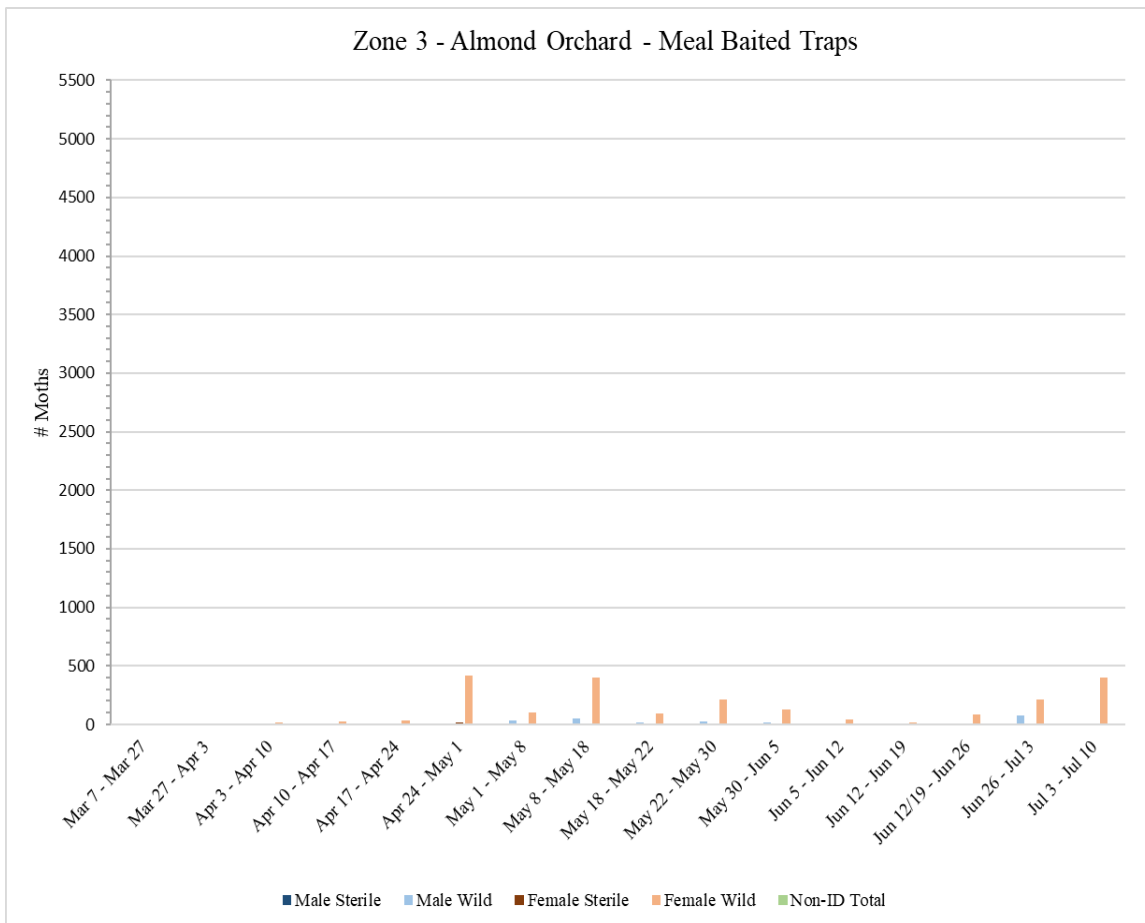


### Zone 3 – Almond Orchard

A total of **36** pheromone/PPO lure-baited traps were collected from Zone 3 on Monday, October 9.

Zone 3 - Almond								
Meal Baited Traps								
Dates Traps in Field	# of Releases During Trap Period	Male Sterile	Male Wild	Male Total	Female Sterile	Female Wild	Female Total	*Non-ID Total
<sup>2</sup> Mar 7 – Mar 27	17	0	0	0	4	0	4	0
Mar 27 – Apr 3	8	0	0	0	0	1	1	0
Apr 3 – Apr 10	8	0	0	0	0	13	13	0
Apr 10 – Apr 17	8	0	0	0	0	22	22	0
Apr 17 – Apr 24	7	0	0	0	3	34	37	0
Apr 24 – May 1	8	4	12	16	20	413	433	1
May 1 – May 8	8	0	32	32	0	105	105	0
May 8 – May 18	10	0	47	47	11	397	408	2
May 18 – May 22	5	1	20	21	0	92	92	0
May 22 – May 30	9	0	27	27	5	214	219	0
May 30 – Jun 5	7	0	13	13	1	126	127	0
Jun 5 – Jun 12	7	0	4	4	2	41	43	1
<sup>3</sup> Jun 12 – Jun 19	6	1	1	2	2	19	21	0
<sup>4</sup> Jun 12/19 – Jun 26	5	0	7	7	5	88	93	0
Jun 26 – Jul 3	3	1	77	78	1	210	211	0
<sup>5</sup> Jul 3 – Jul 10	6	0	4	4	0	397	397	0
<sup>2</sup> No traps were serviced in Zone 3 during the weeks of March 17 and March 24 due to excessive rain preventing access								
<sup>3</sup> Traps 20 – 36 not serviced in Zone 3 during the week of June 23 due to pesticide applications on site								
<sup>4</sup> Traps 20 – 36 in field since June 12								
<sup>5</sup> All meal traps removed from Zone 3 on July 10								

Zone 3 - Almond								
Pheromone/PPO Lure Baited Traps								
Dates Traps in Field	# of Releases During Trap Period	Male Sterile	Male Wild	Male Total	Female Sterile	Female Wild	Female Total	*Non-ID Total
Feb 15 - Feb 22	0	0	0	0	0	0	0	0
<sup>1</sup> Feb 22 – Mar 7	0	0	0	0	0	0	0	0
<sup>2</sup> Mar 7 – Mar 27	17	1	1	2	0	0	0	0
Mar 27 – Apr 3	8	0	12	12	0	0	0	0
Apr 3 – Apr 10	8	1	53	54	0	1	1	0
Apr 10 – Apr 17	8	1	25	26	1	29	30	3
Apr 17 – Apr 24	7	3	26	29	2	152	154	0
Apr 24 – May 1	8	32	420	452	25	429	454	14
May 1 – May 8	8	22	292	314	23	238	261	5
May 8 – May 18	10	57	909	966	0	179	179	12
May 18 – May 22	5	9	215	224	0	21	21	0
May 22 – May 30	9	0	166	166	0	40	40	0
May 30 – Jun 5	7	24	1055	1079	13	432	445	0
Jun 5 – Jun 12	7	9	377	386	0	66	66	0
<sup>3</sup> Jun 12 – Jun 19	6	14	76	90	0	38	38	0
<sup>4</sup> Jun 12/19 – Jun 26	5	26	204	230	2	79	81	0
Jun 26 – Jul 3	3	31	709	740	11	527	538	1
Jul 3 – Jul 10	6	13	513	526	0	1542	1542	4
Jul 10 – Jul 17	8	0	48	48	0	47	47	0
Jul 17 – Jul 24	8	3	735	738	1	270	271	0
Jul 24 – Jul 31	7	3	314	317	1	89	90	0
Jul 31 – Aug 7	7	1	194	195	1	109	110	0
Aug 7 – Aug 14	7	1	144	145	1	227	228	0
Aug 14 – Aug 22	7	6	2475	2481	1	259	260	5
Aug 22 – Aug 28	7	6	3324	3330	0	779	779	7
Aug 28 – Sep 5	8	1	2769	2770	0	1506	1506	6
Sep 5 – Sep 11	6	0	2584	2584	0	987	987	14
Sep 11 – Sep 18	7	34	3417	3451	0	466	466	52
Sep 18 – Sep 25	8	447	1607	2054	78	599	677	5
Sep 25 – Oct 2	5	38	1498	1536	18	1579	1597	4
<b>Oct 2 – Oct 9</b>	<b>6</b>	<b>3</b>	<b>2746</b>	<b>2749</b>	<b>0</b>	<b>559</b>	<b>559</b>	<b>27</b>
<sup>2</sup> No traps were serviced in Zone 3 during the weeks of March 17 and March 24 due to excessive rain preventing access								
<sup>3</sup> Traps 20 – 36 not serviced in Zone 3 during the week of June 23 due to pesticide applications on site								
<sup>4</sup> Traps 20 – 36 in field since June 12								

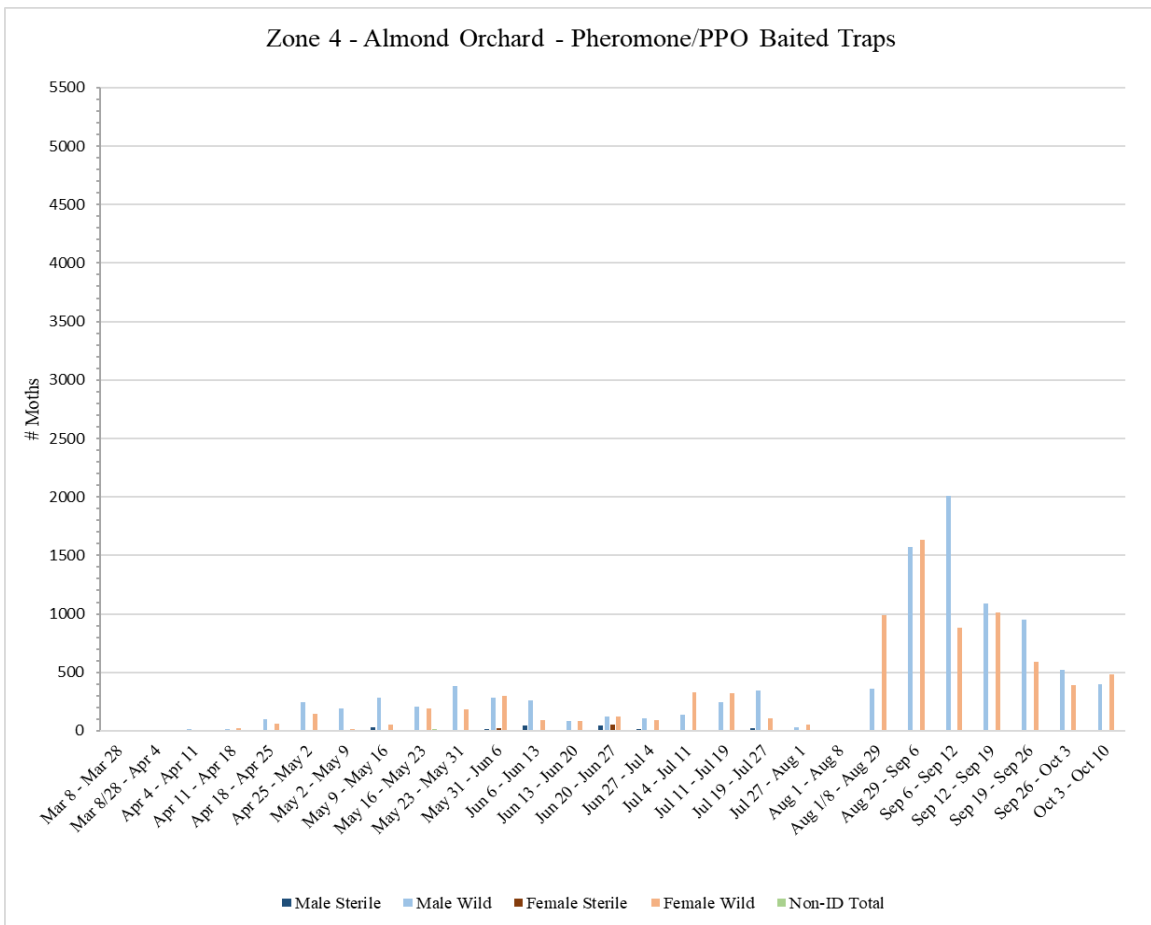
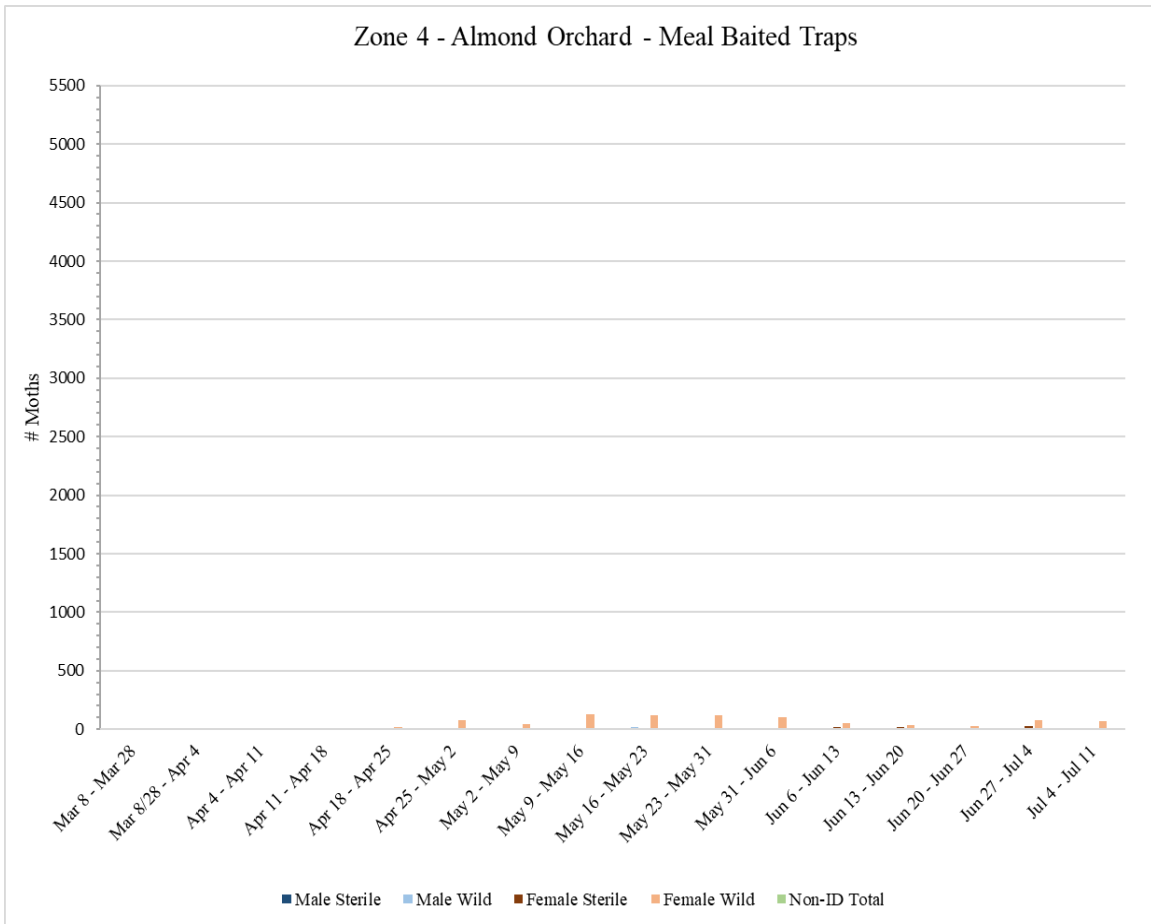


## Zone 4 – Almond Orchard

A total of **35** pheromone/PPO lure-baited traps were collected from Zone 4 on Tuesday, October 10. Trap number 20 was missing this week.

Zone 4 - Almond								
Meal Baited Traps								
Dates Traps in Field	# of Releases During Trap Period	Male Sterile	Male Wild	Male Total	Female Sterile	Female Wild	Female Total	Non-ID Total
<sup>1</sup> Mar 8 – Mar 28	0	0	0	0	0	0	0	0
<sup>2</sup> Mar 8/28 – Apr 4	0	0	0	0	0	0	0	0
Apr 4 – Apr 11	0	0	0	0	0	0	0	0
Apr 11 – Apr 18	0	0	1	1	0	2	2	0
Apr 18 – Apr 25	2	0	0	0	0	20	20	0
Apr 25 – May 2	8	0	6	6	7	81	88	0
May 2 – May 9	8	0	13	13	1	44	45	0
May 9 – May 16	7	0	9	9	4	126	130	0
May 16 – May 23	8	1	16	17	11	124	135	1
May 23 – May 31	8	1	5	6	3	118	121	1
May 31 – Jun 6	6	0	6	6	8	107	115	0
Jun 6 – Jun 13	8	2	1	3	19	55	74	0
Jun 13 – Jun 20	7	5	2	7	19	32	51	0
Jun 20 – Jun 27	7	6	2	8	10	25	35	0
Jun 27 – Jul 4	4	4	1	5	25	74	99	0
<sup>3</sup> Jul 4 – Jul 11	7	6	3	9	4	70	74	0
<sup>1</sup> No traps were serviced in Zone 4 during the weeks of March 17 and March 24 due to excessive rain preventing access; traps 26 – 36 not serviced in Zone 4 during the week of March 31 due to pesticide applications on site								
<sup>2</sup> Traps 26 – 36 in field since March 8								
<sup>3</sup> All meal traps removed from Zone 4 on July 11								

Zone 4 - Almond								
Pheromone/PPO Lure Baited Traps								
Dates Traps in Field	# of Releases During Trap Period	Male Sterile	Male Wild	Male Total	Female Sterile	Female Wild	Female Total	Non-ID Total
<sup>1</sup> Mar 8 – Mar 28	0	0	0	0	0	0	0	0
<sup>2</sup> Mar 8/28 – Apr 4	0	0	1	1	0	0	0	0
Apr 4 – Apr 11	0	0	12	12	0	0	0	0
Apr 11 – Apr 18	0	0	16	16	0	20	20	0
Apr 18 – Apr 25	2	0	96	96	0	60	60	0
Apr 25 – May 2	8	4	246	250	2	145	147	2
May 2 – May 9	8	9	188	197	1	15	16	0
May 9 – May 16	7	29	283	312	0	57	57	6
May 16 – May 23	8	11	207	218	3	195	198	15
May 23 – May 31	8	5	380	385	0	181	181	11
May 31 – Jun 6	6	17	284	301	20	296	316	0
Jun 6 – Jun 13	8	45	261	306	3	93	96	0
Jun 13 – Jun 20	7	4	85	89	2	87	89	0
Jun 20 – Jun 27	7	42	122	164	50	126	176	0
Jun 27 – Jul 4	4	16	107	123	10	94	104	0
Jul 4 – Jul 11	7	10	134	144	2	329	331	0
Jul 11 – Jul 19	8	7	246	253	4	318	322	0
Jul 19 – Jul 27	6	24	342	366	0	109	109	0
Jul 27 – Aug 1	5	11	31	42	0	54	54	0
<sup>4</sup> Aug 1 – Aug 8	7	2	4	6	0	8	8	0
<sup>5</sup> Aug 1/8 – Aug 29	23/17	4	360	364	3	990	993	0
Aug 29 – Sep 6	8	8	1573	1581	0	1630	1630	3
Sep 6 – Sep 12	6	3	2010	2013	3	879	882	0
Sep 12 – Sep 19	6	1	1090	1091	0	1012	1012	6
Sep 19 – Sep 26	7	0	948	948	0	591	591	0
Sep 26 – Oct 3	6	4	523	527	0	390	390	2
<b>Oct 3 – Oct 10</b>	<b>6</b>	<b>2</b>	<b>402</b>	<b>404</b>	<b>0</b>	<b>483</b>	<b>483</b>	<b>0</b>
<sup>1</sup> No traps were serviced in Zone 4 during the weeks of March 17 and March 24 due to excessive rain preventing access; traps 26 – 36 not serviced in Zone 4 during the week of March 31 due to pesticide applications on site <sup>2</sup> Traps 26 – 36 in field since March 8 <sup>4</sup> Traps 19 - 36 not serviced in Zone 4 during the week of August 11 due to pesticide applications on site <sup>5</sup> No traps were serviced in Zone 4 during the week of August 18 due to pesticide applications on site; No traps were serviced in Zone 4 during the week of August 25 due to staffing issues								



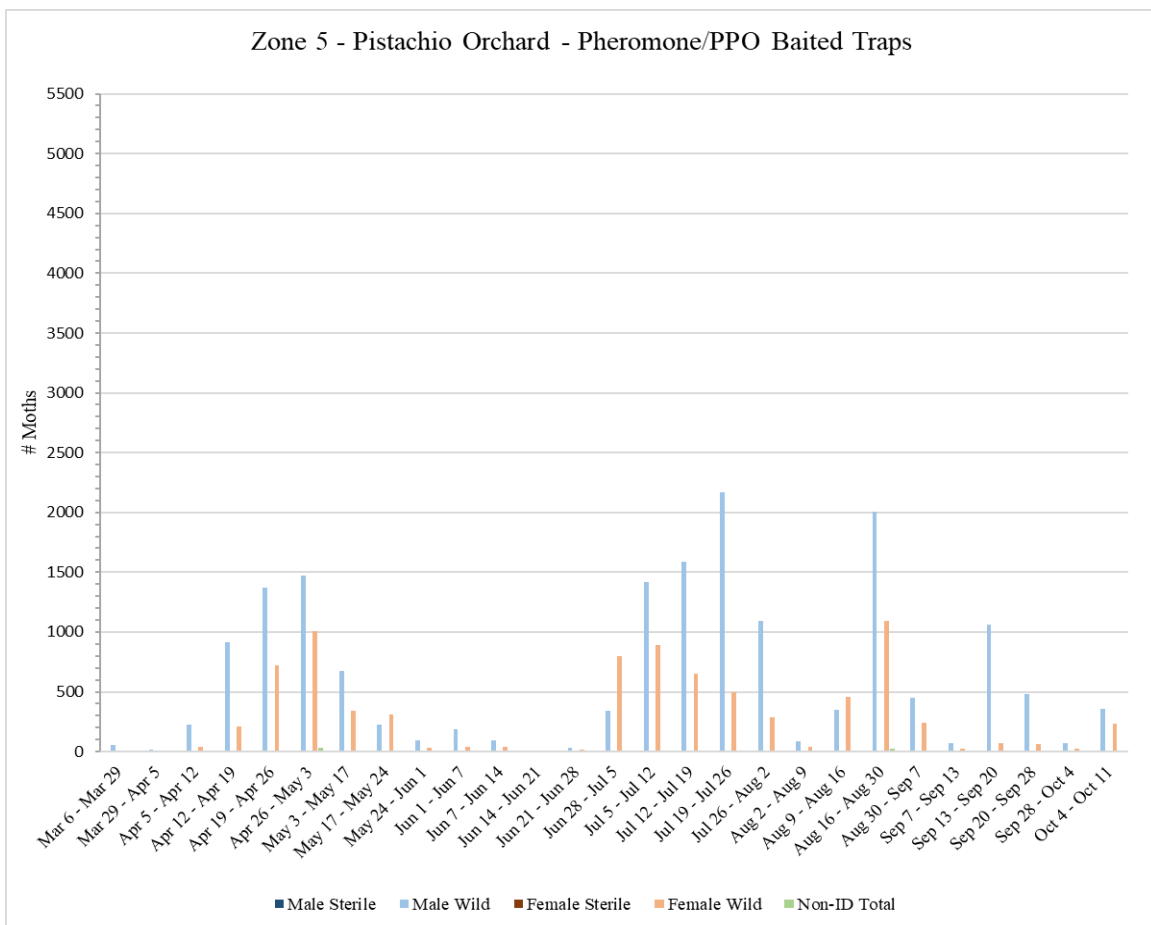
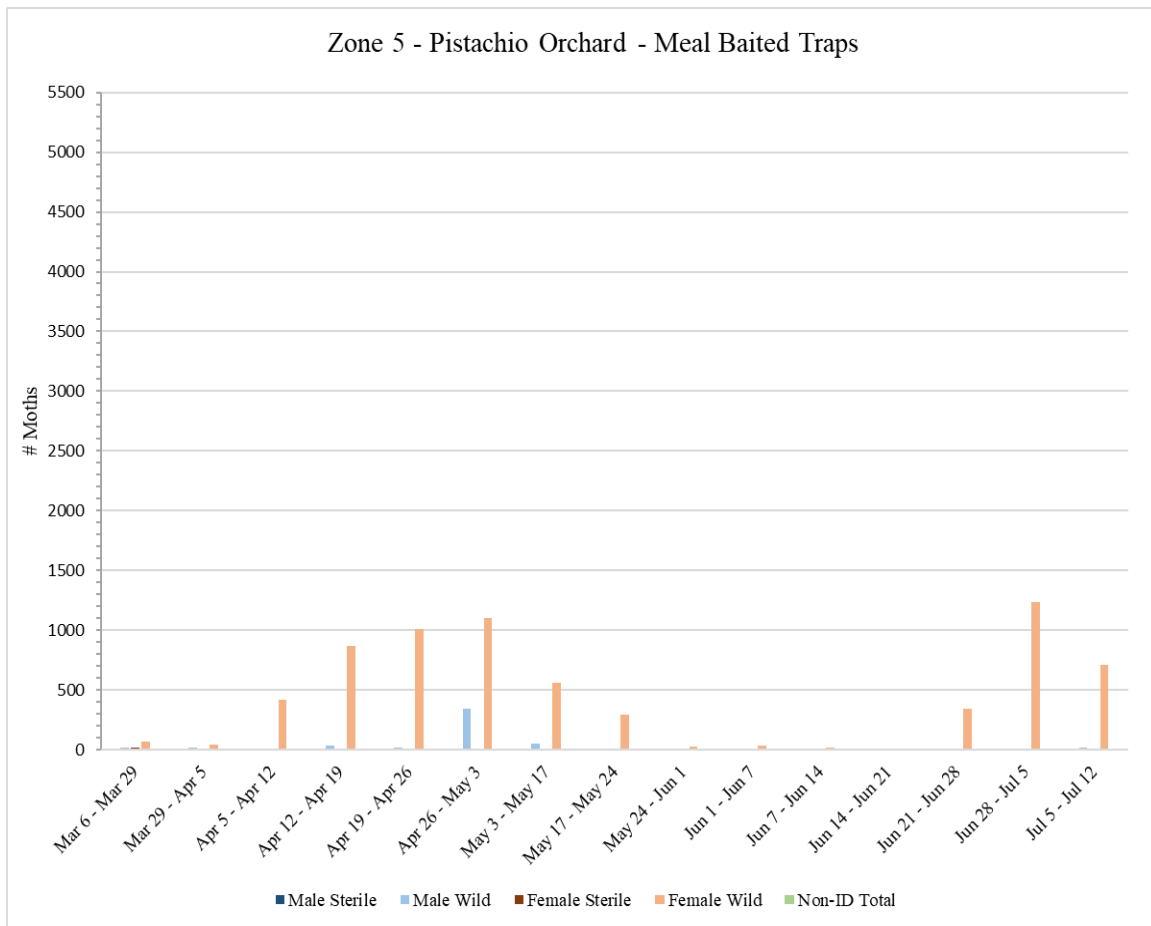


## Zone 5 – Pistachio Orchard

A total of **36** pheromone/PPO lure-baited traps were collected from Zone 5 on Wednesday, October 11.

Zone 5 - Pistachio								
Meal Baited Traps								
Dates Traps in Field	# of Releases During Trap Period	Male Sterile	Male Wild	Male Total	Female Sterile	Female Wild	Female Total	Non-ID Total
<sup>1</sup> Mar 8 – Mar 29	0	6	19	25	16	65	81	1
Mar 29 – Apr 5	0	0	15	15	0	47	47	0
Apr 5 – Apr 12	0	0	13	13	0	422	422	0
Apr 12 – Apr 19	0	0	38	38	1	868	869	3
Apr 19 – Apr 26	0	0	17	17	1	1012	1013	0
Apr 26 – May 3	0	0	343	343	1	1105	1106	12
<sup>2</sup> May 3 – May 17	0	0	52	52	0	557	557	0
May 17 – May 24	0	0	8	8	0	297	297	0
May 24 – Jun 1	0	0	3	3	0	25	25	0
Jun 1 – Jun 7	0	0	1	1	0	32	32	0
Jun 7 – Jun 14	0	0	0	0	0	22	22	0
Jun 14 – Jun 21	0	0	1	1	0	8	8	1
Jun 21 – Jun 28	0	0	5	5	0	344	344	0
Jun 28 – Jul 5	0	0	4	4	0	1237	1237	1
<sup>3</sup> Jul 5 – Jul 12	0	0	22	22	0	707	707	3
<sup>1</sup> No traps were serviced in Zone 5 during the weeks of March 17 and March 24 due to excessive rain preventing access								
<sup>2</sup> No traps were serviced in Zone 5 during the week of May 12 due to pesticide applications on site								
<sup>3</sup> All meal traps removed from Zone 5 on July 12								

Zone 5 - Pistachio								
Pheromone/PPO Lure Baited Traps								
Dates Traps in Field	# of Releases During Trap Period	Male Sterile	Male Wild	Male Total	Female Sterile	Female Wild	Female Total	Non-ID Total
<sup>1</sup> Mar 8 – Mar 29	0	0	52	52	0	2	2	1
Mar 29 – Apr 5	0	0	14	14	0	0	0	0
Apr 5 – Apr 12	0	0	229	229	0	37	37	0
Apr 12 – Apr 19	0	0	916	916	0	207	207	1
Apr 19 – Apr 26	0	0	1373	1373	0	721	721	2
Apr 26 – May 3	0	1	1473	1474	0	1011	1011	31
<sup>2</sup> May 3 – May 17	0	0	674	674	0	341	341	6
May 17 – May 24	0	0	229	229	0	308	308	0
May 24 – Jun 1	0	0	95	95	0	32	32	0
Jun 1 – Jun 7	0	0	183	183	0	38	38	0
Jun 7 – Jun 14	0	0	90	90	0	38	38	0
Jun 14 – Jun 21	0	0	9	9	0	5	5	0
Jun 21 – Jun 28	0	0	28	28	0	18	18	0
Jun 28 – Jul 5	0	0	340	340	0	797	797	1
Jul 5 – Jul 12	0	0	1419	1419	0	890	890	5
Jul 12 – Jul 19	0	0	1589	1589	0	649	649	0
Jul 19 – Jul 26	0	0	2171	2171	0	494	494	2
Jul 26 – Aug 2	0	0	1093	1093	0	289	289	3
Aug 2 – Aug 9	0	0	85	85	0	37	37	0
Aug 9 – Aug 16	0	0	347	347	0	456	456	3
<sup>3</sup> Aug 16 – Aug 30	0	0	2007	2007	0	1091	1091	25
Aug 30 – Sep 7	0	0	447	447	0	239	239	0
Sep 7 – Sep 13	0	0	68	68	0	26	26	0
Sep 13 – Sep 20	0	0	1062	1062	0	71	71	6
Sep 20 – Sep 28	0	0	477	477	0	66	66	6
Sep 28 – Oct 4	0	0	67	67	0	26	26	0
<b>Oct 4 – Oct 11</b>	<b>0</b>	<b>0</b>	<b>355</b>	<b>355</b>	<b>0</b>	<b>231</b>	<b>231</b>	<b>0</b>
<sup>1</sup> No traps were serviced in Zone 5 during the weeks of March 17 and March 24 due to excessive rain preventing access								
<sup>2</sup> No traps were serviced in Zone 5 during the week of May 12 due to pesticide applications on site								
<sup>3</sup> No traps were serviced in Zone 5 during the week of August 25 due to staffing issues								



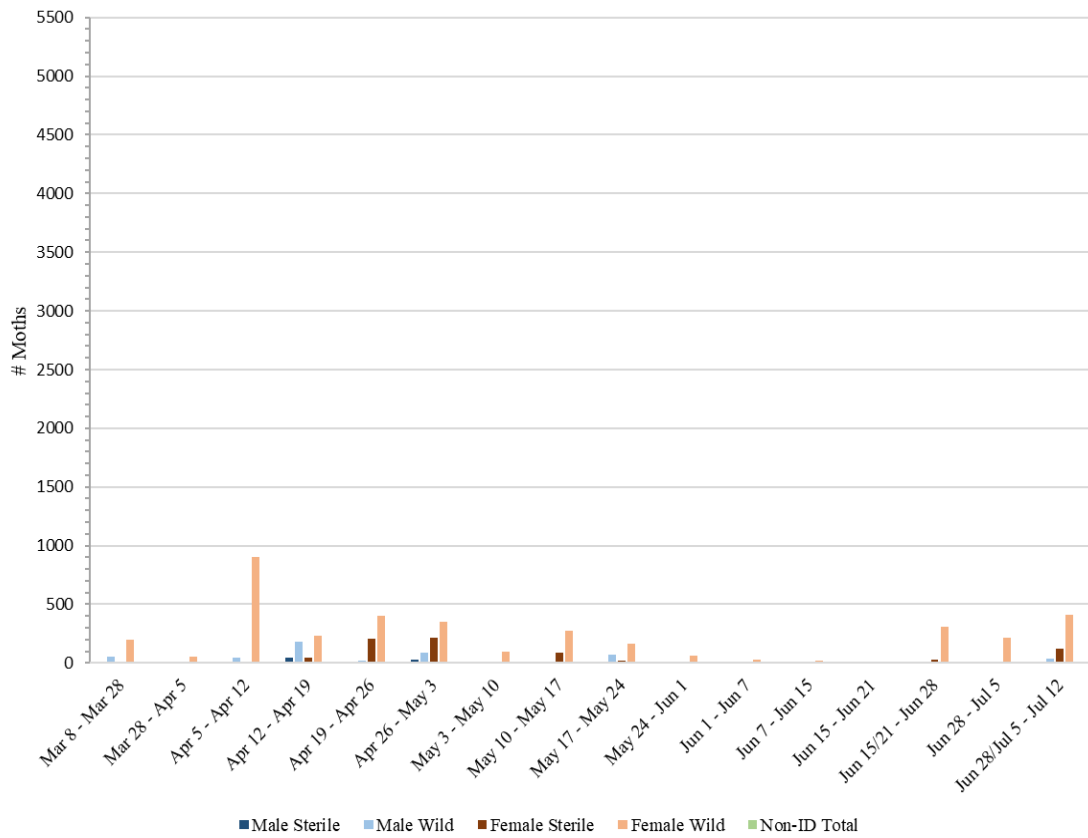
## Zone 6 – Pistachio Orchard

A total of **36** pheromone/PPO lure-baited traps were collected from Zone 6 on Wednesday, October 11.

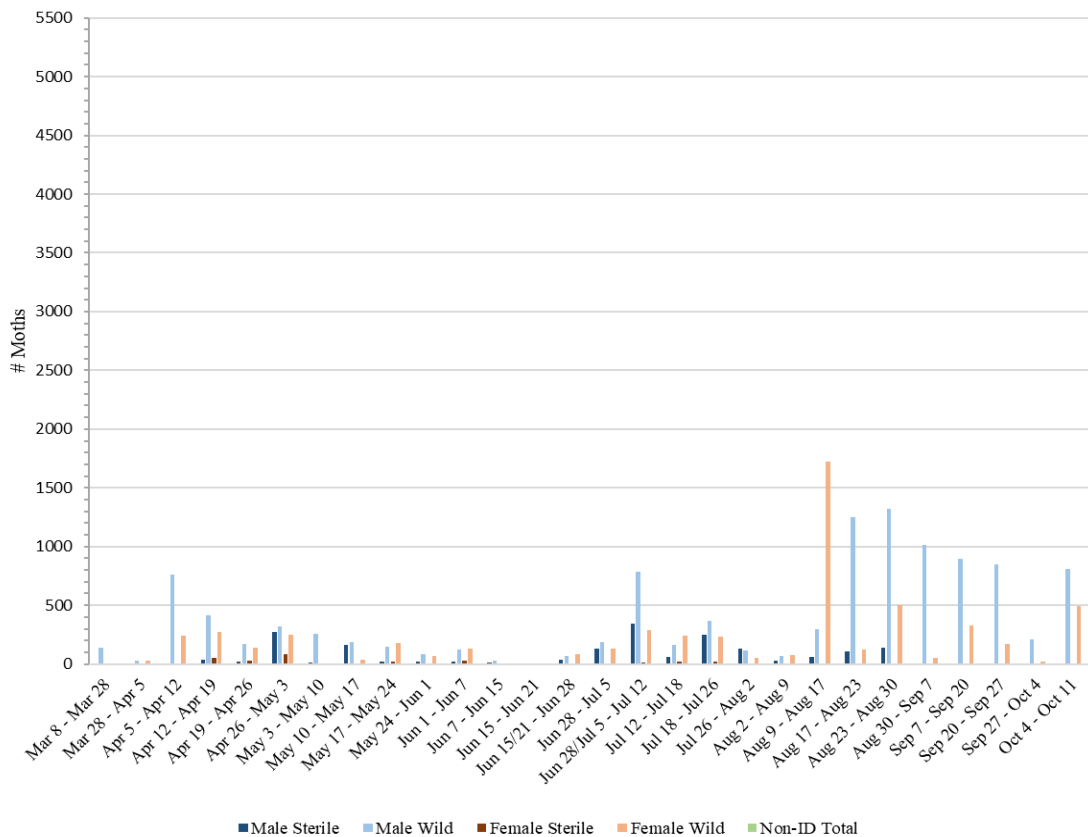
Zone 6 - Pistachio								
Meal Baited Traps								
Dates Traps in Field	# of Releases During Trap Period	Male Sterile	Male Wild	Male Total	Female Sterile	Female Wild	Female Total	Non-ID Total
<sup>1</sup> Mar 8 – Mar 28	0	0	51	51	0	196	196	2
Mar 28 – Apr 5	0	0	11	11	0	50	50	0
Apr 5 – Apr 12	0	0	44	44	0	904	904	0
Apr 12 – Apr 19	7	45	179	224	47	229	276	6
Apr 19 – Apr 26	8	6	19	25	206	400	606	1
Apr 26 – May 3	8	29	90	119	215	353	568	2
May 3 – May 10	7	0	14	14	1	97	98	0
May 10 – May 17	7	5	5	10	90	279	369	0
May 17 – May 24	8	7	68	75	16	165	181	0
May 24 – Jun 1	8	3	2	5	10	61	71	0
Jun 1 – Jun 7	6	2	1	3	11	30	41	0
Jun 7 – Jun 15	7	1	0	1	4	20	24	0
<sup>2</sup> Jun 15 – Jun 21	5	0	0	0	0	9	9	0
<sup>3</sup> Jun 15/21 – Jun 28	4	1	8	9	30	307	337	0
<sup>4</sup> Jun 28 – Jul 5	3	0	5	5	11	215	226	0
<sup>5</sup> Jun 28/Jul 5 – Jul 12	7	3	41	44	123	411	534	0
<sup>1</sup> No traps were serviced in Zone 6 during the weeks of March 17 and March 24 due to excessive rain preventing access								
<sup>2</sup> Traps 10 – 36 not serviced in Zone 6 during the week of June 23 due to pesticide applications on site								
<sup>3</sup> Traps 10 – 36 in field since June 15								
<sup>4</sup> Traps 17 – 36 not serviced in Zone 6 during the week of July 7 due to pesticide applications on site								
<sup>5</sup> Traps 17 – 36 in field since June 28; All meal traps removed from Zone 6 on July 12								

Zone 6 - Pistachio								
Pheromone/PPO Lure Baited Traps								
Dates Traps in Field	# of Releases During Trap Period	Male Sterile	Male Wild	Male Total	Female Sterile	Female Wild	Female Total	Non-ID Total
<sup>1</sup> Mar 8 – Mar 28	0	3	135	138	0	7	7	2
Mar 28 – Apr 5	0	0	31	31	0	25	25	0
Apr 5 – Apr 12	0	0	761	761	0	238	238	2
Apr 12 – Apr 19	7	35	417	452	49	274	323	7
Apr 19 – Apr 26	8	21	169	190	29	142	171	3
Apr 26 – May 3	8	271	317	588	82	249	331	4
May 3 – May 10	7	14	260	274	1	6	7	0
May 10 – May 17	7	162	187	349	0	33	33	0
May 17 – May 24	8	18	143	161	20	176	196	2
May 24 – Jun 1	8	21	85	106	0	65	65	1
Jun 1 – Jun 7	6	17	122	139	29	134	163	0
Jun 7 – Jun 15	7	12	31	43	1	5	6	0
<sup>2</sup> Jun 15 – Jun 21	5	4	0	4	0	3	3	0
<sup>3</sup> Jun 15/21 – Jun 28	4	39	65	104	2	82	84	0
<sup>4</sup> Jun 28 – Jul 5	3	130	183	313	1	131	132	0
<sup>5</sup> Jun 28/Jul 5 – Jul 12	7	341	786	1127	9	292	301	0
Jul 12 – Jul 18	7	58	165	223	17	238	255	0
Jul 18 – Jul 26	7	246	370	616	24	234	258	0
Jul 26 – Aug 2	7	127	111	238	3	54	57	0
Aug 2 – Aug 9	6	30	67	97	1	79	80	0
Aug 9 – Aug 17	5	63	297	360	4	1722	1726	4
Aug 17 – Aug 23	6	110	1247	1357	4	123	127	0
Aug 23 – Aug 30	7	139	1317	1456	0	505	505	0
Aug 30 – Sep 7	7	2	1011	1013	1	51	52	1
<sup>6</sup> Sep 7 – Sep 20	11	7	892	899	0	329	329	0
Sep 20 – Sep 27	7	2	847	849	0	173	173	4
Sep 27 – Oct 4	6	3	207	210	0	19	19	1
<b>Oct 4 – Oct 11</b>	<b>5</b>	<b>0</b>	<b>810</b>	<b>810</b>	<b>0</b>	<b>492</b>	<b>492</b>	<b>6</b>
<sup>1</sup> No traps were serviced in Zone 6 during the weeks of March 17 and March 24 due to excessive rain preventing access								
<sup>2</sup> Traps 10 – 36 not serviced in Zone 6 during the week of June 23 due to pesticide applications on site								
<sup>3</sup> Traps 10 – 36 in field since June 15								
<sup>4</sup> Traps 17 – 36 not serviced in Zone 6 during the week of July 7 due to pesticide applications on site								
<sup>5</sup> Traps 17 – 36 in field since June 28								
<sup>6</sup> No traps were serviced in Zone 6 during the week of September 15 due to pesticide applications on site								

Zone 6 - Pistachio Orchard - Meal Baited Traps



Zone 6 - Pistachio Orchard - Phoromone/PPO Baited Traps



## Zone 7 – Almond Orchard

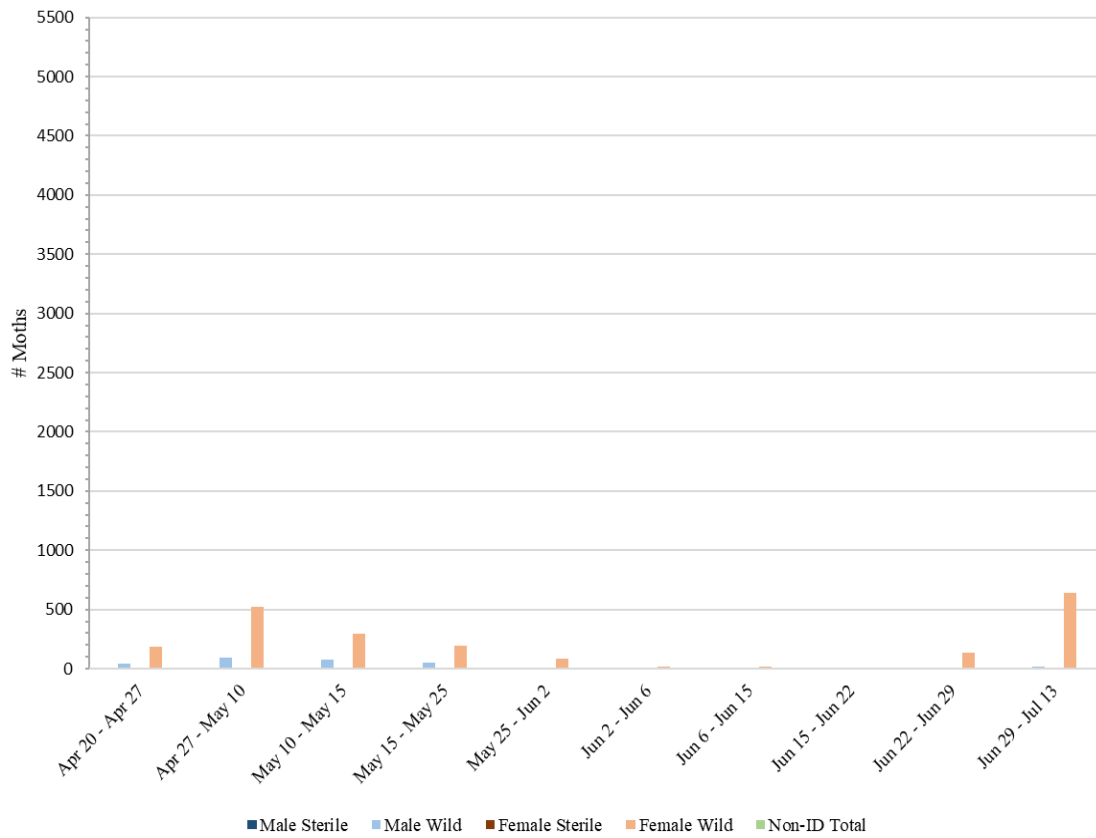
A total of **36** pheromone/PPO lure-baited traps were collected from Zone 7 on Thursday, October 12.

Zone 7 - Almond								
Meal Baited Traps								
Dates Traps in Field	# of Releases During Trap Period	Male Sterile	Male Wild	Male Total	Female Sterile	Female Wild	Female Total	Non-ID Total
Apr 20 - Apr 27	4	0	46	46	5	182	187	0
<sup>1</sup> Apr 27 – May 10	0	0	92	92	2	525	527	4
May 10 – May 15	0	0	76	76	0	291	291	1
May 15 – May 25	0	0	51	51	0	190	190	0
May 25 – Jun 2	0	0	3	3	1	81	82	0
Jun 2 – Jun 6	0	0	2	2	0	21	21	0
Jun 6 – Jun 15	0	0	7	7	1	17	18	0
Jun 15 – Jun 22	0	0	1	1	0	12	12	0
Jun 22 – Jun 29	0	0	1	1	1	135	136	0
<sup>2</sup> Jun 29 – Jul 13	0	0	16	16	0	643	643	0
<sup>1</sup> No traps were serviced in Zone 7 during the week of May 5 due to excessive muddy conditions preventing access								
<sup>2</sup> No traps were serviced in Zone 7 during the week of July 7 due to staff shortage; All meal traps removed from Zone 7 on July 13								

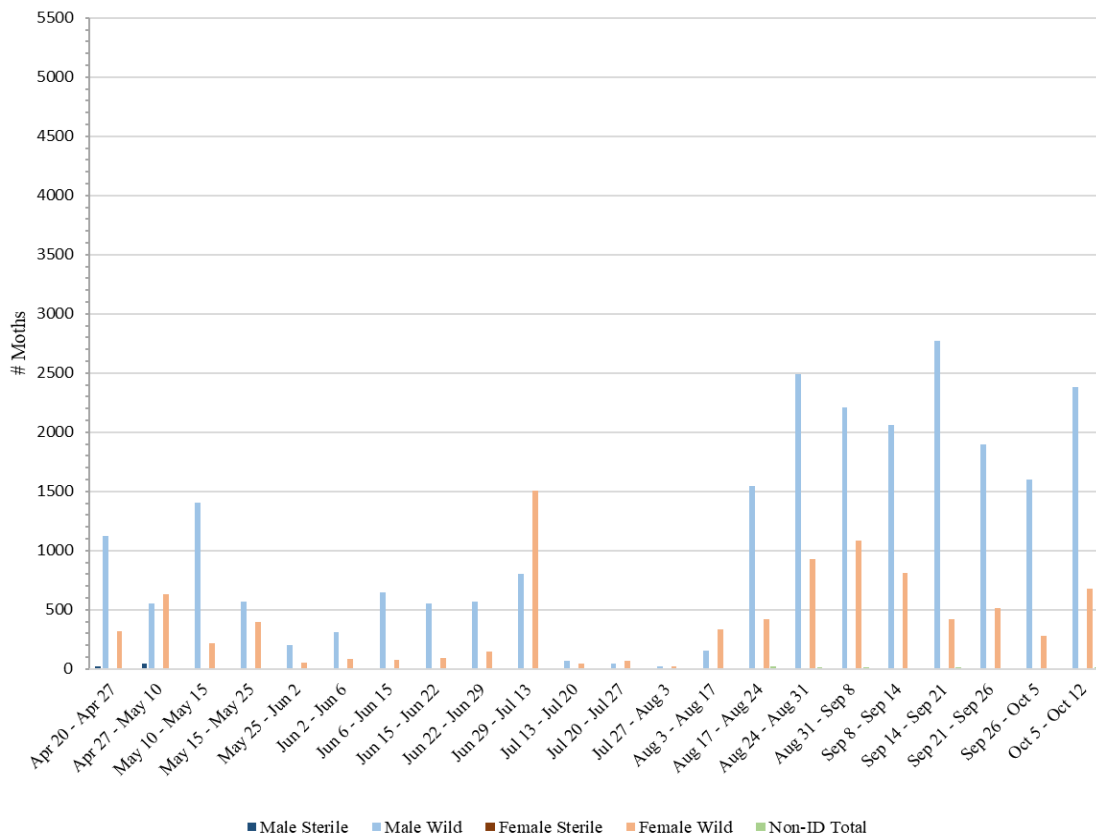
Zone 7 - Almond								
Pheromone/PPO Lure Baited Traps								
Dates Traps in Field	# of Releases During Trap Period	Male Sterile	Male Wild	Male Total	Female Sterile	Female Wild	Female Total	Non-ID Total
Apr 20 - Apr 27	4	19	1126	1145	0	319	319	4
<sup>1</sup> Apr 27 – May 10	0	44	554	598	10	630	640	3
May 10 – May 15	0	0	1403	1403	0	215	215	10
May 15 – May 25	0	0	567	567	0	399	399	0
May 25 – Jun 2	0	0	201	201	0	57	57	2
Jun 2 – Jun 6	0	0	310	310	0	84	84	0
Jun 6 – Jun 15	0	1	650	651	0	74	74	0
Jun 15 – Jun 22	0	1	555	556	0	91	91	0
Jun 22 – Jun 29	0	0	566	566	0	146	146	2
<sup>2</sup> Jun 29 – Jul 13	0	0	806	806	0	1506	1506	3
Jul 13 – Jul 20	0	0	69	69	0	42	42	0
Jul 20 – Jul 27	0	0	45	45	0	66	66	0
Jul 27 – Aug 3	0	0	23	23	0	26	26	0
<sup>3</sup> Aug 3 – Aug 17	0	0	157	157	0	333	333	0
Aug 17 – Aug 24	0	0	1549	1549	0	424	424	21
Aug 24 – Aug 31	0	0	2488	2488	0	929	929	14
Aug 31 – Sep 8	0	1	2213	2214	0	1083	1083	16
Sep 8 – Sep 14	0	0	2058	2058	0	809	809	10
Sep 14 – Sep 21	0	0	2769	2769	0	419	419	15
Sep 21 – Sep 26	0	0	1898	1898	0	515	515	1
Sep 26 – Oct 5	0	0	1601	1601	0	282	282	8
<b>Oct 5 – Oct 12</b>	<b>0</b>	<b>0</b>	<b>2384</b>	<b>2384</b>	<b>0</b>	<b>681</b>	<b>681</b>	<b>16</b>
<sup>1</sup> No traps were serviced in Zone 7 during the week of May 5 due to excessive muddy conditions preventing access								
<sup>2</sup> No traps were serviced in Zone 7 during the week of July 7 due to staff shortage								
<sup>3</sup> No traps were serviced in Zone 7 during the week of August 11 due to pesticide applications on site								



Zone 7 - Almond Orchard - Meal Baited Traps



Zone 7 - Almond Orchard - Pheromone/PPO Baited Traps



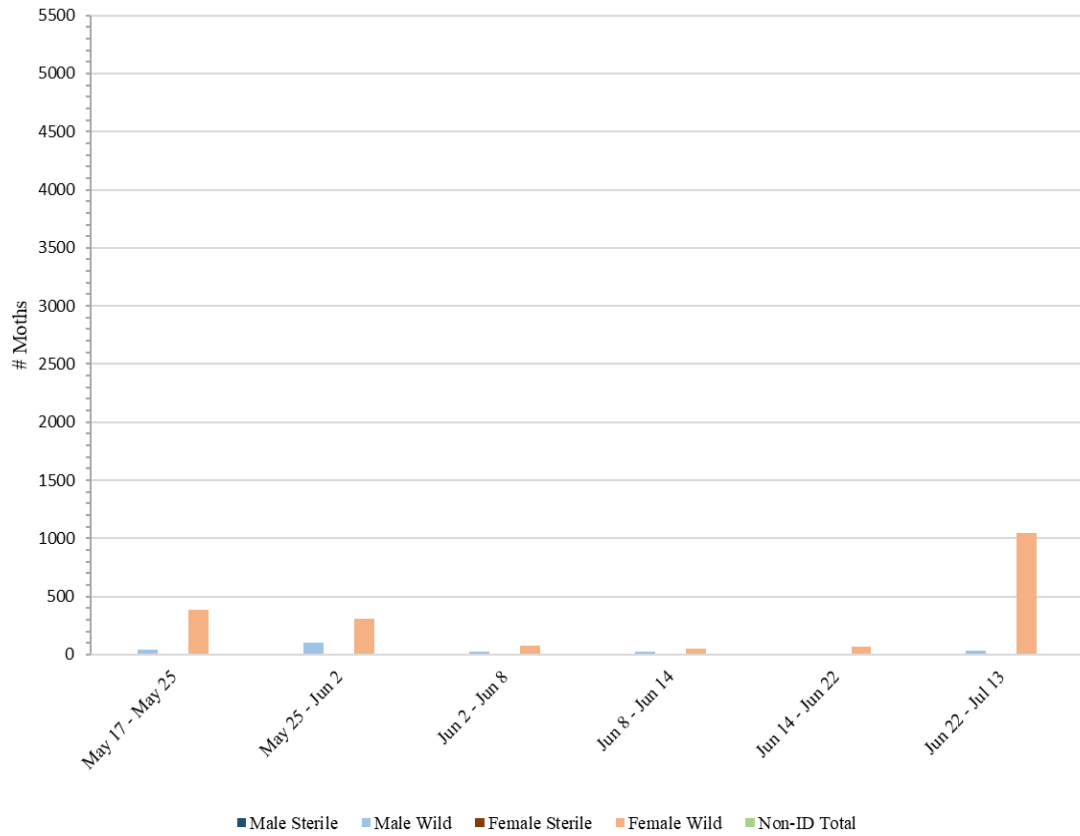
## Zone 8 – Almond Orchard

A total of **36** pheromone/PPO lure-baited traps were collected from Zone 8 on Thursday, October 12.

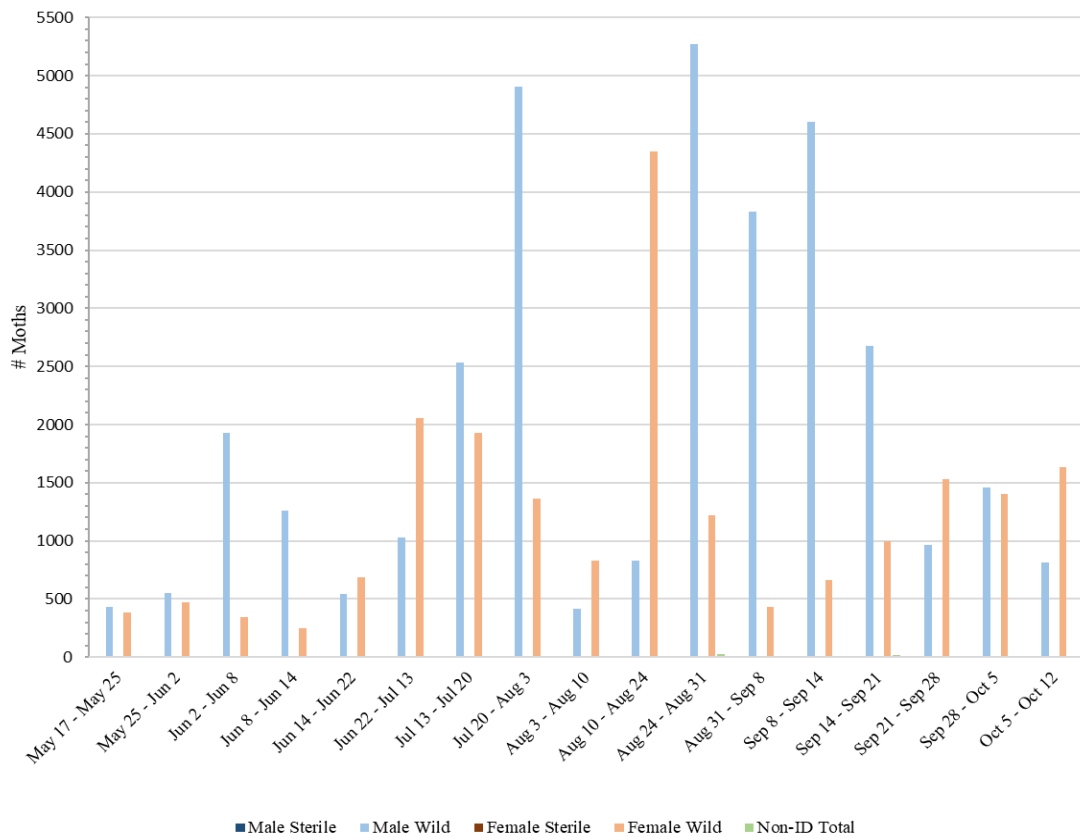
Zone 8 - Almond								
Meal Baited Traps								
Dates Traps in Field	# of Releases During Trap Period	Male Sterile	Male Wild	Male Total	Female Sterile	Female Wild	Female Total	Non-ID Total
May 17 - May 25	0	0	43	43	1	386	387	0
May 25 – Jun 2	0	0	100	100	0	306	306	0
Jun 2 – Jun 8	0	0	29	29	0	79	79	0
Jun 8 – Jun 14	0	0	21	21	0	48	48	0
Jun 14 – Jun 22	0	0	11	11	1	66	67	0
<sup>1</sup> Jun 22 – Jul 13	0	0	31	31	0	1043	1043	0
<sup>1</sup> No traps were serviced in Zone 8 during the weeks of June 30 and July 7 due to pesticide applications on site; All meal traps removed from Zone 8 on July 13								

Zone 8 - Almond								
Pheromone/PPO Lure Baited Traps								
Dates Traps in Field	# of Releases During Trap Period	Male Sterile	Male Wild	Male Total	Female Sterile	Female Wild	Female Total	Non-ID Total
May 17 - May 25	0	0	434	434	0	383	383	0
May 25 - Jun 2	0	0	551	551	0	474	474	5
Jun 2 - Jun 8	0	0	1928	1928	0	345	345	6
Jun 8 - Jun 14	0	1	1259	1260	0	248	248	0
Jun 14 - Jun 22	0	1	541	542	0	685	685	2
<sup>1</sup> Jun 22 - Jul 13	0	0	1029	1029	0	2058	2058	7
Jul 13 - Jul 20	0	0	2531	2531	0	1929	1929	6
<sup>2</sup> Jul 20 - Aug 3	0	0	4905	4905	0	1365	1365	1
Aug 3 - Aug 10	0	0	415	415	0	827	827	0
<sup>3</sup> Aug 10 - Aug 24	0	0	829	829	1	4349	4350	9
Aug 24 - Aug 31	0	0	5274	5274	0	1223	1223	22
Aug 31 - Sep 8	0	0	3829	3829	0	434	434	3
Sep 8 - Sep 14	0	0	4603	4603	0	663	663	2
Sep 14 - Sep 21	0	0	2678	2678	0	994	994	17
Sep 21 - Sep 28	0	0	967	967	0	1533	1533	6
Sep 28 - Oct 5	0	0	1456	1456	0	1406	1406	13
<b>Oct 5 - Oct 12</b>	<b>0</b>	<b>0</b>	<b>814</b>	<b>814</b>	<b>1</b>	<b>1630</b>	<b>1631</b>	<b>0</b>
<sup>1</sup> No traps were serviced in Zone 8 during the weeks of June 30 and July 7 due to pesticide applications on site								
<sup>2</sup> No traps were serviced in Zone 8 during the week of July 28 due to pesticide applications on site								
<sup>3</sup> No traps were serviced in Zone 8 during the week of August 18 due to pesticide applications on site								

Zone 8 - Almond Orchard - Meal Baited Traps



Zone 8 - Almond Orchard - Pheromone/PPO Baited Traps



#### **IV. Quality Control**

QC tests are performed on samples taken from each shipment of sterile NOW moths. These tests include: zero-hour mortality rates, zero-hour mating dissections, forty-eight-hour mating dissections, seven-day longevity monitoring, and crush tests. Throughout the span of a week, Monday through Sunday, the results of each test are averaged. Below are the QC results from samples of sterile NOW moths for Mag 1, released over Zones 1 and 3, and Mag 2, primarily released over Zones 4 and 6, during the week of Monday, October 2, 2023 to Sunday, October 8, 2023:

##### Mag 1:

- 1% of moths from samples found dead at zero hour
- 0% of moths from samples found to have mated at zero hour
- 23% of moths from samples found to have mated after forty-eight hours
- 64% of moths from samples remained alive after seven days in BioChamber
- 98% of moths from samples found to have distinct red dye markings

##### Mag 2:

- 1% of moths from samples found dead at zero hour
- 4% of moths from samples found to have mated at zero hour
- 54% of moths from samples found to have mated after forty-eight hours
- 79% of moths from samples remained alive after seven days in BioChamber
- 94% of moths from samples found to have distinct red dye markings