

Navel Orangeworm Pilot Project 2022 – Weekly Report

Weeks Ending – January 14, January 21, and January 28, 2022

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I. Project Updates

Navel Orangeworm Sterile Insect Technique

The Navel Orangeworm (NOW) Pilot Project (Project) utilizes NOW sterile insect technique (SIT) moths obtained from the United States Department of Agriculture (USDA) Phoenix, Arizona Rearing Facility. Quality Control (QC) tests are performed on every shipment of NOW SIT moths used for aerial releases.

Aerial releases for 2022 are expected to begin in March. The Navel Orangeworm Action Committee (NOWAC) will meet to discuss plans for the 2022 aerial NOW SIT season on Thursday, February 24, 2022.

Navel Orangeworm Trapping

The NOW trapping program 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, continue to be serviced on a weekly basis. Listed below are any circumstances which prevented regular servicing in 2022:

- Week of January 7: No traps were serviced due to severe weather on site
- Week of January 14: No traps were serviced in Zones 1 – 4 due to staffing issues

II. Project Design

The NOW Area Wide Project site includes eight orchards located in Fresno County, identified as Zones 1 through 8. Listed below is information related to each orchard:

| Zone # | Crop Type | Acres | Aerial SIT Release/Non-Release | Date Added to Area Wide Project |
|--------|-----------|-------|--------------------------------|---------------------------------|
| Zone 1 | Pistachio | 640 | Release | May 5, 2020 |
| Zone 2 | Pistachio | 640 | Non-Release | May 5, 2020 |
| Zone 3 | Almond | 640 | Release | May 5, 2020 |
| Zone 4 | Almond | 640 | Non-Release | May 5, 2020 |
| Zone 5 | Pistachio | 640 | Release | May 17, 2021 |
| Zone 6 | Pistachio | 160 | Non-Release | May 17, 2021 |
| Zone 7 | Almond | 640 | Release | May 17, 2021 |
| Zone 8 | Almond | 160 | Non-Release | May 17, 2021 |

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 and 9 trap sites for each 160-acre zone. Trap sites include two traps: one trap baited with NOW pheromone/PPO lures and one trap baited with pistachio meal. 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 Weeks Ending on January 14, January 21, and January 28, 2022

Zone 1

Zone 1 is a pistachio orchard where aerial NOW SIT releases will be conducted. No traps were collected in Zone 1 during the week of January 14 due to staffing issues.

A total of **72** traps were collected from Zone 1 on Wednesday, January 19, with **36** pistachio meal baited traps and **36** pheromone/PPO lure traps.

A total of **72** traps were collected from Zone 1 on Monday, January 24, with **36** pistachio meal baited traps and **36** pheromone/PPO lure traps.

| Zone 1 - Pistachio | | | | | | | |
|---|----------------------------------|--------------|-----------|------------|----------------|-------------|--------------|
| 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 |
| ¹ Dec 27 - Jan 19 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| Jan 19 - Jan 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | |
| ¹ 18 of the 36 traps in field since Dec 20; 18 of the 36 traps in field since Dec 27 | | | | | | | |

| 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 |
| ¹ Dec 27 - Jan 19 | 0 | 0 | 15 | 15 | 0 | 0 | 0 |
| Jan 19 - Jan 24 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| | | | | | | | |
| ¹ 18 of the 36 traps in field since Dec 20; 18 of the 36 traps in field since Dec 27 | | | | | | | |

Zone 2

Zone 2 is a pistachio orchard where aerial NOW SIT releases will not be conducted. No traps were collected in Zone 2 during the week of January 14 due to staffing issues.

A total of **72** traps were collected from Zone 2 on Thursday, January 20, with **36** pistachio meal baited traps and **36** pheromone/PPO lure traps.

A total of **72** traps were collected from Zone 2 on Tuesday, January 25, with **36** pistachio meal baited traps and **36** pheromone/PPO lure traps.

| Zone 2 - Pistachio | | | | | | | |
|---|----------------------------------|--------------|-----------|------------|----------------|-------------|--------------|
| 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 |
| ¹ Dec 21 - Jan 20 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| Jan 20 - Jan 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | |
| ¹ Traps in field since 12/21 | | | | | | | |

| 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 |
| ¹ Dec 21 - Jan 20 | 0 | 0 | 9 | 9 | 0 | 0 | 0 |
| Jan 20 - Jan 25 | 0 | 0 | 3 | 3 | 0 | 0 | 0 |
| | | | | | | | |
| ¹ Traps in field since 12/21 | | | | | | | |

Zone 3

Zone 3 is an almond orchard where aerial NOW SIT releases will be conducted. No traps were collected in Zone 3 during the week of January 14 due to staffing issues.

A total of **72** traps were collected from Zone 3 on Friday, January 21, with **36** pistachio meal baited traps and **36** pheromone/PPO lure traps.

A total of **72** traps were collected from Zone 3 on Wednesday, January 26, with **36** pistachio meal baited traps and **36** pheromone/PPO lure traps.

| Zone 3 - Almond | | | | | | | |
|---|----------------------------------|--------------|-----------|------------|----------------|-------------|--------------|
| 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 |
| ¹Dec 22 - Jan 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan 21 - Jan 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | |
| ¹Traps in field since 12/22 | | | | | | | |

| 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 |
| ¹Dec 22 - Jan 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan 21 - Jan 26 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| | | | | | | | |
| ¹Traps in field since 12/22 | | | | | | | |

Zone 4

Zone 4 is an almond orchard where aerial NOW SIT releases will not be conducted. No traps were collected in Zone 4 during the week of January 14 due to staffing issues.

A total of **72** traps were collected from Zone 4 on Friday, January 21, with **36** pistachio meal baited traps and **36** pheromone/PPO lure traps.

A total of **72** traps were collected from Zone 4 on Thursday, January 27, with **36** pistachio meal baited traps and **36** pheromone/PPO lure traps.

| Zone 4 - Almond | | | | | | | |
|--|----------------------------------|--------------|-----------|------------|----------------|-------------|--------------|
| 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 |
| ¹ Dec 2 - Jan 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan 21 - Jan 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | |
| ¹ Traps in field since 12/2 | | | | | | | |

| 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 |
| ¹ Dec 2 - Jan 21 | 0 | 0 | 26 | 26 | 0 | 1 | 1 |
| Jan 21 - Jan 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | |
| ¹ Traps in field since 12/2 | | | | | | | |

Zone 5

Zone 5 is a pistachio orchard where aerial NOW SIT releases will be conducted. A total of **72** traps were collected from Zone 5 on Wednesday, January 12, with **36** pistachio meal baited traps and **36** pheromone/PPO lure traps.

A total of **72** traps were collected from Zone 5 on Tuesday, January 18, with **36** pistachio meal baited traps and **36** pheromone/PPO lure traps.

A total of **72** traps were collected from Zone 5 on Monday, January 24, with **36** pistachio meal baited traps and **36** pheromone/PPO lure traps.

| Zone 5 - Pistachio | | | | | | | |
|--|----------------------------------|--------------|-----------|------------|----------------|-------------|--------------|
| 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 |
| ¹ Dec 20 - Jan 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan 12 - Jan 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan 18 - Jan 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | |
| ¹ Traps in fields since 12/20 | | | | | | | |

| 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 |
| ¹ Dec 20 - Jan 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan 12 - Jan 18 | 0 | 0 | 24 | 24 | 0 | 0 | 0 |
| Jan 18 - Jan 24 | 0 | 0 | 7 | 7 | 0 | 0 | 0 |
| | | | | | | | |
| ¹ Traps in fields since 12/20 | | | | | | | |

Zone 6

Zone 6 is a pistachio orchard where aerial NOW SIT releases will not be conducted. A total of **18** traps were collected from Zone 6 on Tuesday, January 11, with **9** pistachio meal baited traps and **9** pheromone/PPO lure traps.

A total of **18** traps were collected from Zone 6 on Wednesday, January 19, with **9** pistachio meal baited traps and **9** pheromone/PPO lure traps.

A total of **18** traps were collected from Zone 6 on Tuesday, January 25, with **9** pistachio meal baited traps and **9** pheromone/PPO lure traps.

| Zone 6 - Pistachio | | | | | | | |
|---|----------------------------------|--------------|-----------|------------|----------------|-------------|--------------|
| 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 |
| ¹Dec 21 - Jan 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan 11 - Jan 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan 19 - Jan 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | |
| ¹Traps in field since 12/21 | | | | | | | |

| 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 |
| ¹Dec 21 - Jan 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan 11 - Jan 19 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| Jan 19 - Jan 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | |
| ¹Traps in field since 12/21 | | | | | | | |

Zone 7

Zone 7 is an almond orchard where aerial NOW SIT releases will be conducted. A total of **72** traps were collected from Zone 7 on Thursday, January 13, with **36** pistachio meal baited traps and **36** pheromone/PPO lure traps.

A total of **72** traps were collected from Zone 7 on Thursday, January 20, with **36** pistachio meal baited traps and **36** pheromone/PPO lure traps.

A total of **72** traps were collected from Zone 7 on Wednesday, January 26, with **36** pistachio meal baited traps and **36** pheromone/PPO lure traps.

| Zone 7 - Almond | | | | | | | |
|--|----------------------------------|--------------|-----------|------------|----------------|-------------|--------------|
| 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 |
| ¹Dec 8 - Jan 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan 13 - Jan 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan 20 - Jan 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | |
| ¹Traps in field since 12/8 | | | | | | | |

| 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 |
| ¹Dec 8 - Jan 13 | 0 | 0 | 6 | 6 | 0 | 0 | 0 |
| Jan 13 - Jan 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan 20 - Jan 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | |
| ¹Traps in field since 12/8 | | | | | | | |

Zone 8

Zone 8 is an almond orchard where aerial NOW SIT releases will not be conducted. A total of **18** traps were collected from Zone 8 on Tuesday, January 11, with **9** pistachio meal baited traps and **9** pheromone/PPO lure traps.

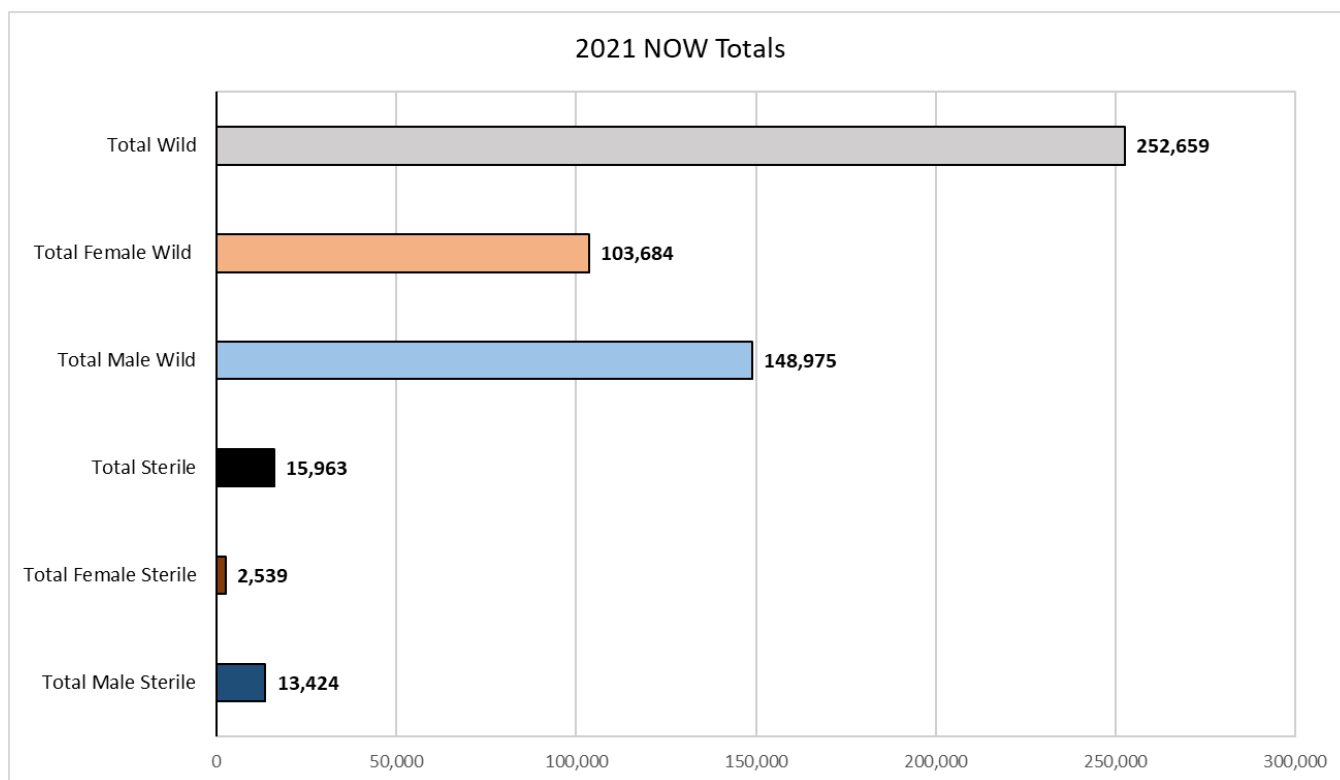
A total of **18** traps were collected from Zone 8 on Wednesday, January 19, with **9** pistachio meal baited traps and **9** pheromone/PPO lure traps.

A total of **18** traps were collected from Zone 8 on Tuesday, January 25, with **9** pistachio meal baited traps and **9** pheromone/PPO lure traps.

| Zone 8 - Almond | | | | | | | |
|---|----------------------------------|--------------|-----------|------------|----------------|-------------|--------------|
| 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 |
| ¹ Dec 21 - Jan 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan 11 - Jan 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan 19 - Jan 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | |
| ¹ Traps in field since 12/21 | | | | | | | |

| 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 |
| ¹ Dec 21 - Jan 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan 11 - Jan 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Jan 19 - Jan 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | |
| ¹ Traps in field since 12/21 | | | | | | | |

IV. 2021 Trapping Season Totals (December 28, 2020 – December 31, 2021)



V. Quality Control (2018 – 2021)

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 2021 SIT season's average QC results for Mag 1 and Mag 2 from the period of Wednesday, March 10, 2021 to Saturday, October 16, 2021.

- 2% of moths from samples found dead at zero hour
- 1% of moths from samples found to have mated at zero hour
- 36% of moths from samples found to have mated after forty-eight hours
- 84% of moths from samples remained alive after seven days in BioChamber
- 83% of moths from samples found to have distinct red dye markings

