

# Impact of Sex, Age, and Mating Status on Flight Behavior of the Navel Orangeworm (NOW)

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## PROJECT SUMMARY

### Objectives:

- Develop methods and baseline data for flight mill experiments with navel orangeworm.
- Compare the flight activity of unmated adults by sex and age.
- Examine impact of mating on the age-specific flight capacity of males and females

### Background and Discussion:

The current flight mill study shows that single-night median flight distance of unmated navel orangeworm adults is 4.5-6.6 miles for males and 4.1-8.7 miles for females depending on age during the first five days of adult life. Maximum distances were 16.6-24.5 miles for males and 33.9-41.1 miles for females. We are now examining flight capacity of mated males and females of different ages.

The navel orangeworm is an important pest of not only almonds, but also pistachios and walnuts. As the acreage of these nut crops have expanded in recent years and as mating disruption has entered the arsenal of management tactics for this pest, understanding the circumstances and impact of inter-orchard movement has become increasingly important.

Flight mills are used to study the flight capacity of an insect under controlled conditions. The laboratory of Thomas Sappington, in Ames, Iowa,

is one of a few places in the world where this technique is being used to study moth species. In flight mill experiments, insects are attached with glue to a light metal arm balanced on a center pivot. An infrared detector along the center pivot detects each revolution of the arm, which represents a distance of one meter. Data from an array of 15 mills in a walk-in environmental chamber are sent to a computer and compiled by a custom program.

While flight mill studies offer comparisons under more tightly defined physiological conditions (e.g., age and mating status) than field studies, data from these two approaches (i.e., flight mill vs. field) must be compared for a more complete understanding. Flight mill data indicate minimum distances possible for navel orangeworm moths to travel, and are consistent with recent findings of higher damage in almonds located up to three miles from pistachio blocks, potential sources of higher navel orangeworm abundance.

These data indicating high capacity for long-distance flight do not necessarily mean the navel orangeworm routinely disperses such long distances in the field. Field data confirm that adults can travel at least half a mile in a night, but also show that a significant proportion stay in the release orchard for several nights, and apparently mate near where they emerge. Field studies of damage suggest a non-linear relationship between oviposition and dispersal distance, with most damage occurring within 200-300 yards of the site of emergence.

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**Project Cooperator:** Thomas Sappington

### For More Details, Visit

- Poster location 53, Exhibit Hall A and B during conference; or on the web (after January 2013) at [www.almondboard.com/research](http://www.almondboard.com/research)