NOW Flight Behavior, and PPO for Monitoring in Mating Disruption Orchards

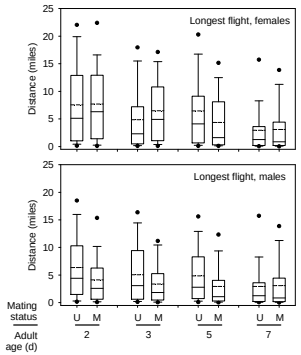
Chuck Burks[1] and Tom Sappington[2]

USDA, Agricultural Research Service: [1]Parlier, CA; and [2]Ames, IA

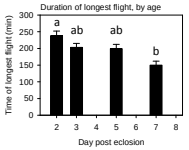
1) Effect of sex and mating status on flight capacity (Burks, Sappington)

In these flight mill experiments, insects were attached with glue to a light metal arm balanced on a center pivot. An infrared detector along the center pivot detected each revolution of the arm, which represented 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.

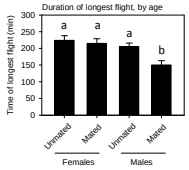
Effect of age and mating status on longest single flight (N = 855)



Flight capacity diminished with age.



Females were stronger fliers than males; unmated moths were stronger fliers than mated moths, and mating had greater impact on males



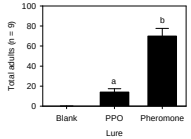
Conclusions and ongoing work

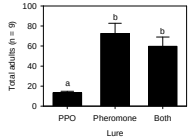
- Sex and mating status had statistically significant effects on flight capacity of NOW.
- Adults nonetheless had substantial flight capacity through most of their reproductive life. Compared to this substantial flight capacity, difference due to sex and mating status were of minor practical importance.
- Follow-up work is examining whether there is a trade-off between flight and eggs laid in females.

2) Phenyl propionate (PPO) for monitoring NOW in the presence of mating disruption (C Burks, LPS Kuenen, and KM Daane)

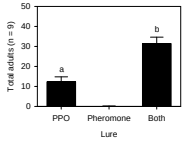
- Mating disruption is effective and sometimes advantageous as control method for NOW
- The recently released NOW pheromone lure greatly enhances monitoring of NOW, but detects NOW poorly in the presence of mating disruption
- Previous work demonstrated that PPO attracts NOW adults of both sexes in non-disrupted orchards
- Here we examined the potential of PPO, alone or in combination with pheromone lures, for monitoring in the presence of mating disruption.

In the <u>absence</u> of mating disruption PPO attracts fewer adults than pheromone lure, and adds nothing when used with the lure.





In the <u>presence</u> of mating disruption PPO continues to attract adults, and more are attracted when combined with pheromone lure.



The pheromone lure by itself is, of course, shut down in the presence of mating disruption.

Sex of adults captured PPO captured similar numbers of males and females, whereas sex pheromone captured only males. Pheromone/PPO combinations captured more males than females, both in the absence and in the presence of mating disruption.

Conclusions and ongoing work

- Combination PPO/pheromone lures show promise for monitoring NOW in the presence of mating disruption.
- Further work is needed on formulation of PPO.