Role of male density and pheromone concentration in mating disruption of CM and OBLR

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Results & Discussion

Over 100 video clips were collected depicting various aspects of CM and OBLR mating behavior. These still frames show some of the action. At left an OBLR male has landed on the leaf and is hassling the CM female while another OBLR male has arrived via the OBLR female’s pheromone plume. At right, a calling OBLR female and a male just arriving. Note the proximity to lures at the top of frame.

Methods

A very simple wind tunnel was used to evaluate the effect of pheromone concentration and male density on the mating success of CM and OBLR (at left). Red septa lures were hung in a grid of 9 lures above the tunnel to simulate mating disruption (MD). A single OBLR and CM female were tethered to live apple foliage and males were released into the bottom of the tunnel at four different densities: 1, 2, 3, or 5 males per female. Infrared digital video was used to film the females and record mating behaviors. Females were later dissected to determine whether they had been mated.

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There was a treatment for both OBLR and CM that resulted in higher mating than the control treatment where no pheromone was present at all. For CM this occurred with the 0.1X lure grid and with OBLR it occurred with the 0.01X lure grid. This demonstrates that too little pheromone could actually enhance mating rather than deter it. With OBLR there was a more or less standard relationship where increased pheromone concentration led to decreased mating. This relationship was roughly true with CM as well, but with one important exception. The pheromone concentration difference between 1X and 10X is 100 fold yet the two concentrations provided roughly the same level of mating disruption. In fact, a 1X lure grid (10 times greater than the 0.1X grid) gave the best control, suggesting that it is also possible to have too much pheromone with CM.

Acknowledgements

Gratitude is extended to the Washington Tree Fruit Research Commission and USDA-CSREES for funding. Custom lures provided by Joan Fischer of Suterra LLC, and Trece, Inc. Special thanks to Teah Clement for outstanding assistance with this work.