1997 California Avocado Research Symposium pages 43-44
California Avocado Society and University of California, Riverside

Avocado Pollination in California Growing Conditions

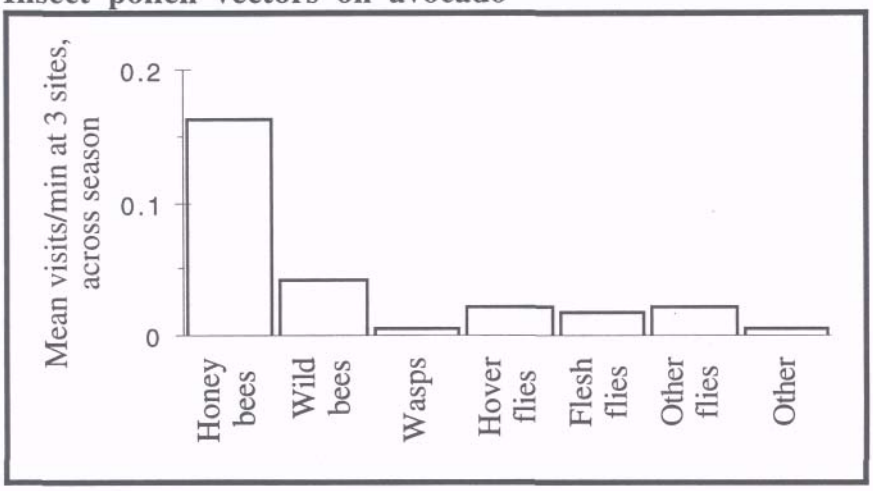
Project Leader: P. Kirk Visscher
Dept of Entomology
University of California, Riverside

The Goal

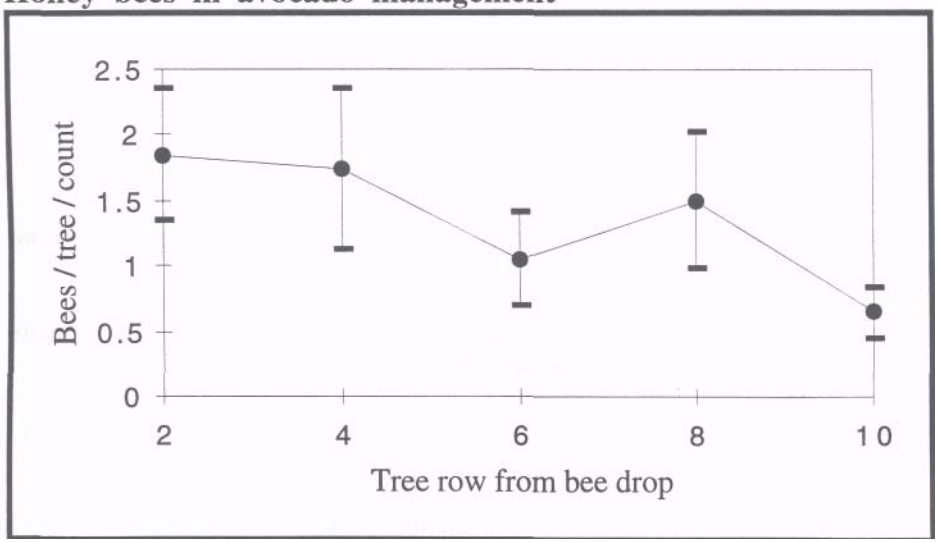
This project is concerned with the role of insect pollinators in getting from flower to fruit, and beyond, to maturity. Fruit set requires pollination and pollination requires appropriate weather (especially appropriate temperatures), availability of compatible pollen, and insects to carry the pollen from one blossom to another. This project concentrates on the last of these: what insects are doing pollination, and how can we manipulate them to maximize productivity.

This is a multi-year project, in part because we expect year-to-year variation in the results, and part because each year builds on previous findings. We now have one year of data, and are just beginning our second.

Insect pollen vectors on avocado



Honey bees in avocado management



We have surveyed insects at 3 sites (in Ventura, Orange, and San Diego counties). These surveys have revealed a number of insects not previously known to visit avocado, including some interesting wild bees, but even in orchards with no added bees, honey bees were by far the most common visitors.

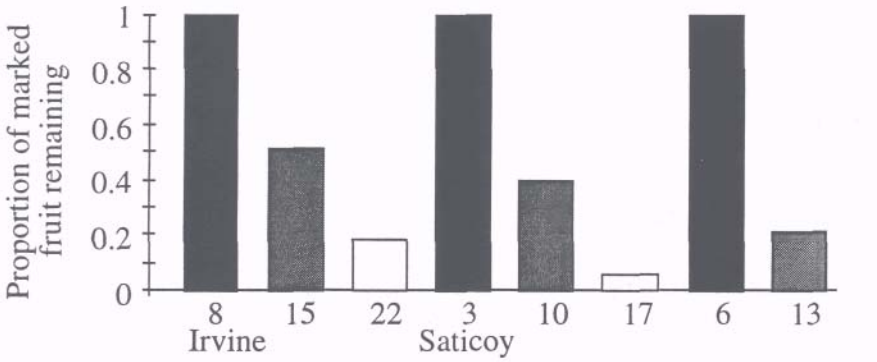
We have begun to analyze these insects for the pollen they carry and their behavior as regards pollen transfer.

We found a small but significant effect of distance from hives with honey bee density, which we will correlate with yield when harvest is completed.

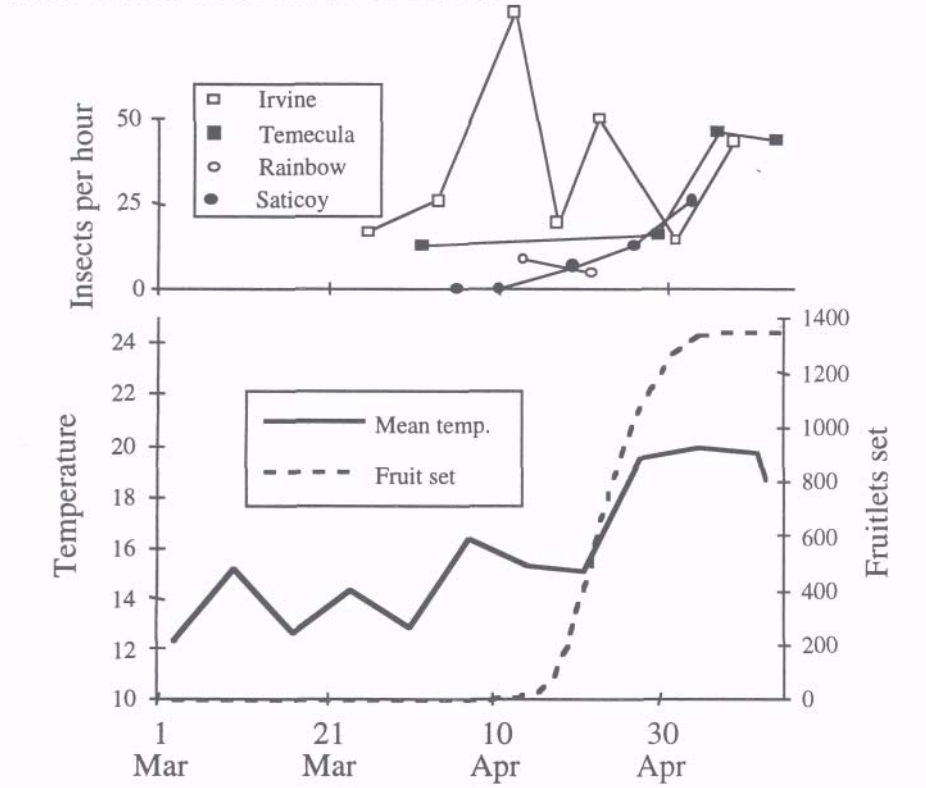
The fruit originally set does not all remain to harvest, an effect that is probably influenced by local weather and growing conditions, cross pollination with other

cultivars, and plant resources (including fruit set previous year).

What about fruit loss after pollination and fruit set?



What limits fruit set in avocados?



This is a complex question that will involve integrating many lines of research by our group and others. Results from year one suggest that differences within the season in pollinator density are probably not the cause of the timing of fruit set, and temperature is more likely to determine this. This does not imply that pollinators play no role: when temperatures are appropriate, fruit set will still require them. However, it may not be the lack of pollinator in cool weather that limits cool-spring fruit set, but the temperature itself, since our data suggest pollinators were present at similar densities before and

during the period of favorable temperatures.

Summary

We have found many insects on avocado bloom but honey bees remain the most likely candidate for providing pollination, especially since they can be easily manipulated.

We are making progress toward a useful index of bee density for growers to make pollinator decisions. We will continue these studies for several years, since probably variation year to year makes multi-year data important.

The questions of pollinator / weather limitation provide an intriguing clue about pollination management, but require more study to provide firm conclusions.

Resource limitation in the trees may limit the extent to which pollination manipulation can help fruit set (especially fruit retention), and bears on the alternate bearing tendency of avocados.