THE EFFECT OF ALTERNATIVE PREY ON THE CONTROL OF *Oligonychus perseae*

EFECTO DE LA PRESENCIA DE PRESA ALTERNATIVA EN EL CONTROL DE *Oligonychus perseae*

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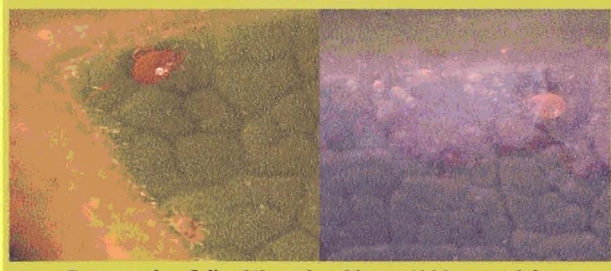
Introduction

In an avocado orchard of the south-east of Spain, the population dynamics of the two most abundant predators of the persea mite, *Oligonychus perseae,* in our area, the phytoseiids *Euseius stipulatus* and *Neoseiulus californicus*, had, during 2006, two peaks. The first peak was in spring and before the appearance of the pest. Interestingly, the dynamics of pollen of olive trees (*Olea europaea*) in the atmosphere correlated well to that of phytoseiids. The dominant phytoseiid species in the first peak was the pollen-feeder *E. stipulatus* (c.a. 80%).



Euseius stipulatus (left) and *Neoseiulus californicus* (right) on avocado leaves

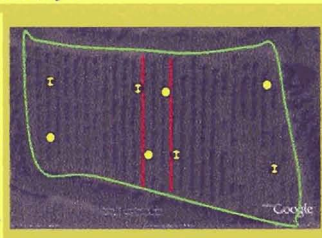
We, therefore, hypothesized that increasing the pollen deposition rate on the surface of leaves could sustain higher populations of phytoseiids, which, in turn, would negatively affect the population of *O. perseae*. In this work we first assessed in the lab the suitability of different types of pollen as food source for *E. stipulatus*; second, we evaluated in the field the effect of intercropping pollen-releasing maize plants within an avocado orchard, on the persea mite and phytoseiids populations, and on leaf damage.

Material & Methods

A) Oviposition rate of *E. stipulatus* with pollen as food source (25ºC, 60% RH and 16:8 L.D).
The experimental set-up consisted on plastic arenas placed on a layer of water-soaked cotton-wool, on which pollen of either olive or maize was added, *ad libitum*. Arenas with no pollen were used as control. One *E. stipulatus* female (10-15 d old since egg stage) was placed on the arenas and, after 24, 48 and 72 h, the number of eggs laid was counted. Daily oviposition rates were obtained averaging the number of eggs laid during the second and third days.

B) Intercropping maize plants in the field
Three lines of maize (cv. Lina, Semillas Batlle) were planted in two laneways (red lines) in a 2 Ha "Hass" avocado orchard. Four trees from the plot with maize and two trees from the subplots w.o. maize, were selected (yellow circles). The number of occupied nests and number of necrotic spots on the UHL2*, and the number of the phytoseiid mites per leaf were counted in 5 leaves at c.a. 150 cm height from the East and West sides.

* UHL2: Upper half of the left second vein of the underside of the leaf.

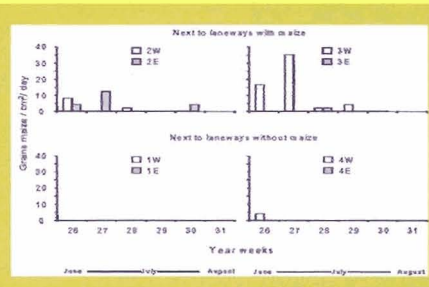


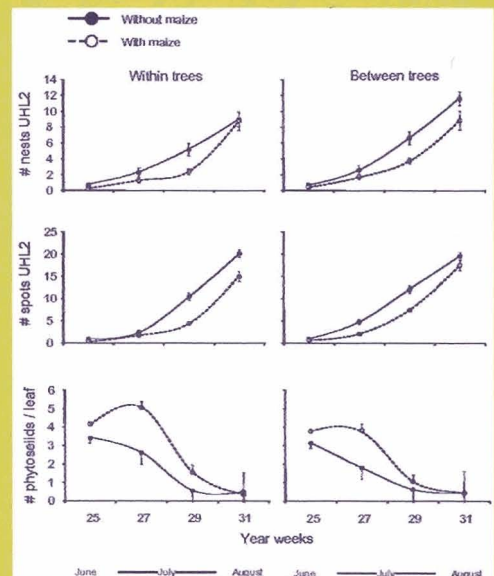
Counting was done *in situ* every 15 days, starting June 21st and ending August 3rd. Estimation of maize pollen deposition on avocado leaves in each treatment and side was done with microscope slides coated with silicone placed in rectangular horizontal platforms on wooden sticks c.a. 150 cm high (small black circles), and left amid the canopy during 48 h a week. In the lab, slides were stained with glycerine jelly containing basic fuchsine and longitudinally scanned under microscope at 400x.

Results

A) The oviposition rate (eggs/day) of *E. stipulatus* fed on olive and maize pollen was 1.36±0.14 and 1.15±0.19 eggs/day, respectively. Oviposition when no food was given was null.

B) Intercropping maize plants maize decreased the number of occupied nests and the number of necrotic spots on the UHL2, and increased the number of phytoseiid mites per leaf and maize pollen deposition on microscope slides. This pattern was observed both when trees from the plot with maize were compared to those from plots without maize (Between trees), and when sides with and without maize of trees in the plot with maize were compared (Within trees).





Conclusions

1- The presence of pollen deposited on avocado leaves was likely responsible for the increase of the phytoseiid population in spring. Olive pollen, the most abundant in the atmosphere in spring, and maize pollen, the species used in the field experiment, were suitable as food source for *E. stipulatus*, the dominant phytoseiid species in spring.

2- Artificial addition of a source of alternative prey to the system affected the abundances of the species. Avocado trees next to intercropped maize plants had more phytoseiids, less persea mites and less leaf damage. However, the effects of the alternative prey on phytoseiid abundances, and, consequently, on pest density and damage, decresed with time because we failed at keeping the alternative prey supply constant. Direct supply of stored pollen on the trees at regular intervals will probably intensify the effects observed in our work.