

DEVELOPMENT AND VALIDATION OF A SAMPLING STRATEGY FOR *OLIGONYCHUS PUNICAE* AND *O. PERSEAE* (ACARI: TETRANYCHIDAE) IN AVOCADO CV. HASS

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Introduction. Statistical sampling allows to make inferences about different variables or characters of the population, such as the average density of a pest. Calculation of the sample size must take into account the spatial distribution of the organism studied. In general, mites are distributed as aggregates resulting in large sample sizes.

In Mexico, the main species of mites that affect negatively avocado trees are *Oligonychus punicae* and *O. perseae*; they feed on the cell contents of the leaves producing different physiological disturbances, a diminished vigor and low productivity. Thus, it is important to define a sampling strategy to know with enough accuracy and precision the different variables related to the population of this avocado pest.

Material and methods. The present work was carried out in an avocado var. "Fuerte" orchard in Coatepec Harinas, México (18°55', 99°44', 2278 meters of altitude). Nine different experiments were performed to determine the size of the sample. In each experiment, 10 leaves were collected in ten different trees chosen at random to evaluate the number of mobile individuals of each species. Mite density per leaf (900 leaves in 9 experiments) was analyzed as conglomerates, being the primary unit the tree and the secondary unit, the leaves. ANOVA was applied to study differences among and within trees, the trees were considered as the independent variable and the number of mobile individuals as the dependent variable.

Taylor expansion method was employed to estimate the spatial distribution of the mite population in the orchard. This law describes a mathematical relationship between the mean of the population and the variance, $S^2 = amb$. Constants a and b were determined using linear regression between the logarithms of the mean and the logarithms of the variance.

The sampling strategy was validated in 8 samplings, using as criterion of the consistency of the methodology the precision of each sampling.

Results and discussion. Based on the methodology described above, to get a sample with an 80% of confidence and a precision of 0.25 requires 120 leaves in 12 trees in the case of *O. punicae*. Meanwhile, in the case of *O. Perseae*, 170 leaves in 17 trees yield similar confidence and precision levels. Regarding the validation of the sampling strategy, in all the cases the precision was maintained within the parameters previously established.