SPATIAL DISTRIBUTION OF LEAFROLLERS ATTACKING APPLE AND IMPLICATIONS FOR SAMPLING PROGRAMS

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Abstract: The spatial distribution of leafrollers attacking apples in Washington was examined using isotropic variograms. The analysis showed that significant autocorrelation existed in all situations except when populations were only found in one small portion of a field. The percentage of the variance associated with spatial components was related to the area covered by the sampling grid. The closer together samples were taken, the greater the importance of the spatial component. The range of autocorrelation was 5-9 meters when every tree within an area was sampled, but varied from ≈22-210 meters at the larger scales. These data suggest that infestations within a field start as a number of small foci that expand over time to cover relatively large areas. The spatial distributions observed suggest that sampling sites within a block could be separated by 100 meters or more to reduce statistical dependence in the data, but sampling units within a site should draw from a number of trees within ≈9 meters. These conclusions will be tested this coming year in large-scale validation plots.