Abstract

Seasonal and spatial distribution of *Typhaea stercorea* (L.) and *Tribolium castaneum* (Herbst) infesting farm-stored maize in South Carolina were studied by trapping with grain probe traps. Trap catch (numbers captured per week) and weekly mean grain temperature for each trap site were plotted against time and fitted to cubic polynomials, which adequately described seasonal trends. Spatial distribution of trap catch was examined by calculating the coefficient of variation, or dispersion (s^2/m) and by constructing a contour map of trap catch values for each week. Seasonal trends in trap catch varied with species, farm, and storage season, and tended to parallel temperature trends, so that trap catch and temperature were positively correlated. Trap catch was highly aggregated except for weeks when few insects were captured. Residuals (observed–predicted values), calculated from the fitted trend curves, represent the spatial component of variation. When residuals were analyzed, the positive correlation between temperature and trap catch was usually reduced or abolished, indicating that spatial variability within any given week reflected the distribution of the population itself, rather than spatial variability in activity produced by temperature gradients. The number of insects captured by a trap is determined mainly by insect activity and the numbers present, but there are no rigorous methods for separating the immediate effect of temperature on activity from the delayed effect on population growth. However, by comparing trends in trap catch with those in temperature, it is sometimes possible to make inferences about changes in population density.