

SAMPLING TO DETERMINE TREATMENT EFFICACY

Subramanyam BHADRIKAJU¹, David W. HAGSTRUM² and Robert L.
*MEAGHER*¹

¹*Department of Entomology, University of Minnesota, St. Paul, Minnesota
55108, USA.
Fax:??*

² *USDA-ARS, U.S. Grain Marketing Laboratory, Manhattan, Kansas 66502,
USA.*

Sampling insects infesting stored products provides information necessary for determining if control measures are needed, and if insects have been effectively controlled. Routine chemical applications, especially with fumigants or controlled atmospheres, are done without a valid pre- and post-treatment density estimation of insects. Therefore, the degree and duration of insect suppression obtained are often unknown. This uncertainty results in unnecessary treatments or unnecessary commodity damage because of delayed treatments. Accurate assessment of treatment efficacy requires: i) the use of appropriate tools for sampling insects, and 2) characterizing insect distribution based on sampling data to obtain valid estimates of insect density. The selection of an appropriate sampling tool depends on species and stage of the insect being sampled, precision of the density estimate needed, and detection sensitivity of the sampling device. The spatial and temporal distribution of insects must be characterized by fitting probability distribution functions (Poisson, negative binomial, binomial) or Taylor's Power Law to sampling data. This characterization helps in determining the precision and sample sizes required for insect density estimation, and for classifying insect density or damage with respect to an economic threshold. Sampling is an integral component of integrated pest management (IPM). The development of an appropriate sampling protocol for determining treatment efficacy is essential for cost-effective management of insects.