

Development and Validation of a Fixed-Precision Sequential Sampling Plan for Aster Leafhopper (Homoptera: Cicadellidae) in Carrot

Patrick O'Rourke, Eric C. Burkness and William D. Hutchison

Department of Entomology, 219 Hodson Hall, 1980 Folwell Avenue,
University of Minnesota, St. Paul, Minnesota, 55108

Environ. Entomol. 27: 1463-1468 (1998)

ABSTRACT. From 1995 to 1997, a total of 351 data sets were collected from 30 fields in central and southern Minnesota to determine the most efficient fixed-precision sequential sampling plan for density estimation of aster leafhopper, *Macrostelus quadrilineatus* (Forbes), in carrot. Conventional and organic farms were sampled to obtain a range of leafhopper densities likely to be encountered with various management practices. Densities ranged from 0.01 to 6.97 leafhoppers/sweep. Taylor's *a* and *b* parameters were estimated from 266 data sets and used in conjunction with 15 independent data sets to validate the sampling plan with resampling software (Resampling Validation for Sampling Plans). The results showed that, for a density range of 0.01-1.61 leafhoppers/sweep, 20, 10-sweep samples must be taken to achieve an average precision level of 0.25. In subsequent analyses, results were partitioned into low (<0.17 leafhoppers/sweep) and high (0.17 leafhoppers/sweep) density data sets. Further analysis, using modified precision levels, showed that either 86, 10-sweep samples (low densities) or 5, 10-sweep samples (high densities) were needed to achieve the desired average precision level of 0.25. Implementation of this plan requires growers to collect a minimum of 5, 10-sweep samples; if the mean density is 0.17, then mean actual precision is 0.25, and no further sampling is necessary. For densities <0.17, an additional 5, 10-sweep samples should be taken (for a total of 100 sweeps), and final density estimated (precision may be >0.25). Final density can be compared to the aster yellows index for control guidelines.

Cite paper as:

O'Rourke, P.K., E.C. Burkness and W.D. Hutchison. 1998. Development and validation of a fixed-precision sequential sampling plan for aster leafhopper (Homoptera: Cicadellidae) in carrot. Environ. Entomol. 27: 1463-1468.

Abstract reprinted with permission; Entomol. Soc. Am.