Chapter 13

Nitrate Leaching and Economic Analysis Package (NLEAP):
Model Description and Application

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A computer applications model (nitrate leaching and economic analysis package or NLEAP) was developed to implement the theories, methods, and equations described in this and other chapters of the publication. The computer program is user oriented and designed for use by farmers, extension personnel, and action agencies such as the U.S. Soil Conservation Service (SCS) who required rapid, site-specific estimates of nitrate-N (NO$_3$-N) leaching potential under agricultural crops along with potential impacts of NO$_3$-N leaching on associated aquifers. The user supplies or selects basic information concerning on-farm management practices, soils, climate, and economics. The model then translates this information into projected N budgets, potential NO$_3$-N leaching below the root zone, economic impacts, and potential off-site effects of NO$_3$-N leaching. Considerable use is made of regional soil and climate databases; or the user can supply his own information for all or part of these inputs. Also, the model can be configured (via internal coefficients) to conform to local conditions and requirements.

The NLEAP model uses a three-phase approach to the problem. These phases include an annual screening analysis that provides initial estimates of potential NO$_3$-N leaching, while monthly and event-by-event water and N budgets are used for more-detailed analyses. The initial screening analysis provides a rapid means of identifying potential NO$_3$-N leaching problems and suggesting additional steps in the analysis. The user is encouraged to try the screening analysis first, and then to use the more-detailed approaches if significant potential NO$_3$-N leaching is identified.