Sample Frequency Effects on Estimates of Nitrate-N Losses from Subsurface Tile Drains. (A05-kladivko153752-Poster)

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Abstract:

Concern about nitrate-N in effluent from subsurface drains requires technically and statistically valid water quality data. However, intensive monitoring with frequent (daily or more) analysis of nitrate-N concentration is expensive and difficult. The objective of this study was to determine the accuracy of nitrate-N loss estimates from subsurface drainage plots based on varying sampling frequency. Concentration values representing 7-day, 30-day, and 90-day sampling frequencies were combined with continuous flow data to obtain mass loss estimates, using all combinations or a random (Monte Carlo) selection. Estimates were compared to the 'true' mass loss (based on flow-weighted sampling using all available concentration measurements) to obtain probability distributions and 95% confidence intervals. For the weekly sample frequency, the probability of estimating the annual mass loss within 15% of the 'true' mass loss was 92%; for monthly (30-day) sampling frequency, the probability was 68%; and for 90-day frequency the probability was 51%. Results of this study can help researchers select cost-effective sampling frequencies based on their specific accuracy requirement.

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