Watershed Scale Modeling of Alternative Practices to Reduce Nitrogen Losses to the Environment. (S11-mulla110347-Oral)

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Abstract:

Total Maximum Daily Loads will set an upper limit on the mass of nitrate-N that can be transported to streams draining agricultural watersheds. Little research has been conducted to evaluate how watershed scale loads of nitrate-N change in response to changes in agricultural management practices. We used a daily time-step continuous water table management model to simulate three years of water quality monitoring data for flow and nitrate at the mouth of an agricultural watershed (Bevens Creek) in southern Minnesota. The model performed well, predicting 67% of the variability in nitrate-N loads in the watershed. Reductions in fertilizer rate of 50% would result in reductions in nitrate losses from drainage of 23%. Changes from fall to spring application of fertilizer resulted in reductions of nitrate-N loss of about 34%. Increasing the amount of cropland with tile drainage by 34% caused nitrate-N losses to increase by 10%.

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