

Public Abstract

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Title:Modeling the Influence of Climate and Management Practices on Water Quality in Goodwater Creek Experimental Watershed

The objective of this study was to use statistical regression to determine relationships among weather, runoff, water quality, and best management practice (BMP) implementation in reducing atrazine loadings and concentrations in the 7,250-ha Goodwater Creek Experimental Watershed in Audrain and Boone Counties in Northeast Missouri. This study examined data collected from 1993 through 2003. During that period the amount of area protected by BMPs, such as grassed waterways, increased by 10%, and the use of conservation tillage and no-till in Audrain County increased from 45% to 80%. Flow and water quality constituents were monitored at the outlet of the watershed. Annual, monthly and seasonal regressions were conducted among water quality indicators, climatic variables, and an index that incorporated the change in area protected by BMPs during that period. Results showed significant decreases in atrazine concentrations for June and the combined months of April, May, and June. No significant trends were observed for atrazine loadings. Covariate analysis of the effect of BMP protected area on atrazine concentrations showed that the time period analyzed was important. More specific atrazine application data could allow for a better analysis, rather than a comparing data on a monthly or seasonal time period. Inputs were developed for the Soil and Water Assessment Tool (SWAT) program. The SWAT model was able to simulate decreased atrazine concentrations with as little as 4.5% of the watershed protected by grassed waterways. Changes in the amount of land in conventional, conservation, and no-till tillage systems also affected the simulated atrazine concentrations.