USDA-CSREES 2005 National Water Quality Conference

Assessment of Best Management Practice Alternatives in a Kansas-Nebraska Watershed Using the SWAT Model

Abstract: Nonpoint source (NPS) pollution from agricultural runoff is considered a major threat to surface water quality in Kansas, but the diffuse nature of agricultural runoff makes pollutant sources difficult to identify. Identifying and implementing best management practices (BMPs) that reduce NPS loading will be fundamental to meeting water quality goals.

Objectives: A major objective of this project is to evaluate a spectrum of BMPs for their effectiveness at reducing sediment, nutrient and pesticide loadings to surface water at the watershed scale and develop BMP recommendations for meeting water quality goals.

Methods: The Soil and Water Assessment Tool (SWAT) model is being used to evaluate BMP effectiveness in the Lower Little Blue River watershed of Kansas and Nebraska based on local, field scale research knowledge.

Partnerships: The major partnership supported by this project has been with the Blue River Compact, comprising various federal, state and local agencies in Kansas and Nebraska.

Resources: The major resources committed to this project have been faculty and staff time and state geographic information system (GIS) resources.

Integration of Research, Teaching, and Extension: This project was designed to evaluate field based research at watershed scales using the SWAT model, develop and extend this information as BMP recommendations to the watershed community, and incorporate assessment techniques and new knowledge into university research and curriculum.

Results: Numerous management practices and various combinations of BMPs have been modeled using SWAT to assess their impacts on water quality parameters (i.e., sediment, nutrients, and atrazine) within the watershed. In general, the greatest reductions in NPS pollutant yields were achieved by implementing field buffers and no tillage cultivation practices. BMP recommendations for meeting water quality goals are now being developed based on modeling results and are being planned for presentation in the Lower Little Blue River watershed this year.

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