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## Soil erosion and water quality

Mahdi Al-Kaisi

*Iowa State University*, [malkaisi@iastate.edu](mailto:malkaisi@iastate.edu)

Michael J. Tidman

*Iowa State University*

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# Soil erosion and water quality

## **Abstract**

The relationship between water quality and soil erosion cannot be overemphasized. Soil erosion and residue management, especially surface water runoff, influence water quality. A 1999 tillage survey sponsored by the Iowa Resource Management Partnership committee indicated the need for improvement in adopting conservation practices. The survey shows no increase in conservation tillage (no-till) for the period 1997-1999. Residue management is a critical component in controlling soil erosion.

## **Keywords**

Agronomy

## **Disciplines**

Agricultural Science | Agriculture | Agronomy and Crop Sciences | Hydrology | Soil Science

# INTEGRATED CROP MANAGEMENT



## Soil erosion and water quality

The relationship between water quality and soil erosion cannot be overemphasized. Soil erosion and residue management, especially surface water runoff, influence water quality. A 1999 tillage survey sponsored by the Iowa Resource Management Partnership committee indicated the need for improvement in adopting conservation practices. The survey shows no increase in conservation tillage (no-till) for the period 1997-1999. Residue management is a critical component in controlling soil erosion.

Conservation tillage, residue management, and cultural management play a significant role in increasing the efficiency of nutrient management practices and erosion control. To ensure reliable and profitable yield, producers apply herbicides, pesticides, fertilizers, amendments, or manure. Most of these materials attach to soil particles, where they function as intended. However, some of these contaminants are likely to be transported with soil particles and sediment when soil erodes, thereby affecting water quality. Therefore, controlling erosion is the crucial link in any plan to improve water quality.

It is critical to manage soil erosion to protect water quality and to meet criteria set by total maximum daily load (TMDL) allocations for 91 of 157 impaired water bodies that have been affected by sediment in Iowa, where soil erosion control and residue management become a priority. The Environmental Protection Agency (EPA) uses TMDLs to manage and allocate the amount of pollutants discharged into streams, rivers, and lakes. TMDLs were originally designed to regulate point source pollution, such as discharge from factories, into rivers and lakes.

Now, concerns over water quality problems have been traced to agriculture, and the EPA is considering using its authority under the Clean Water Act of 1972 to set TMDLs for non-point source pollution. TMDLs could be used to set guidelines for nitrogen, phosphorus, and sediment flow into water bodies. TMDLs could change the way producers use land and control erosion. Tillage and manure and nutrient management would all have to be linked, and monitoring could be used to identify and solve problems.

Help for producers could come from tools such as the Iowa Phosphorus Index (P Index). The P Index is an assessment tool with three major components: soil erosion, surface runoff, and soil infiltration and leaching. The P Index was not designed to be a regulatory tool; instead, it is a procedure to identify sources of potential P movement and to determine when management practices are needed to decrease the probability of P loss.

Because this is an important issue in agriculture, Iowa State University will host a conference [1] on March 5-7 about water quality called, "Agriculture and the Environment--State and Federal Water Initiatives." Attendees will hear about and discuss issues affecting water

quality, and address federal and state pollution policies that impact their management of land. There will also be opportunities to learn more about TMDLs, nutrient criteria, animal feeding operations, and source water protection.

The Iowa State University College of Agriculture, Iowa State University Extension, The Iowa State Water Resources Research Institute, the Leopold Center for Sustainable Agriculture, and the Iowa Department of Natural Resources sponsor the conference.

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