



# Drainage Management to Reduce Nitrate Loads from Midwestern Agriculture

GREAT LAKES  
REGION



**National Theme:**  
Nutrient and Pesticide Management

## Project Description

Subsurface drainage is very common in the Great Lakes states, with the percentage of cropland that is drained estimated to be more than 30% in five of the six states. There are several water quality concerns related to subsurface drainage, the most critical being nitrate-N, a soluble nitrogen ion that moves wherever water moves. Nitrate in surface water is a growing national concern: in drinking water, it is harmful to children and infants; and it contributes to hypoxia in the Gulf of Mexico.

Drainage water management, the practice of using a water control structure in the drain to raise and lower the drainage outlet to various depths, is one promising option for reducing nitrate loads from subsurface drains. Other practices that can reduce nitrate loads include growing winter cover crops, fine-tuning fertilizer application rates and timing, and modifying drainage system design.

This project works with research, extension, and industry professionals, in collaboration with the Agricultural Drainage Management Systems Task Force, to advance drainage management systems. Drainage management research is focused on field-scale and watershed-scale analysis of the potential of drainage water management to reduce nitrate loading while maintaining drainage during critical periods, enhancing yields, and maintaining soil quality. Education and outreach is focused on enabling producers and contractors to understand drainage management alternatives and benefits.



Installing structures to help control subsurface drainage.

## PROJECT CONTACTS

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## PROJECT PARTNERS

USDA Agricultural Research Service

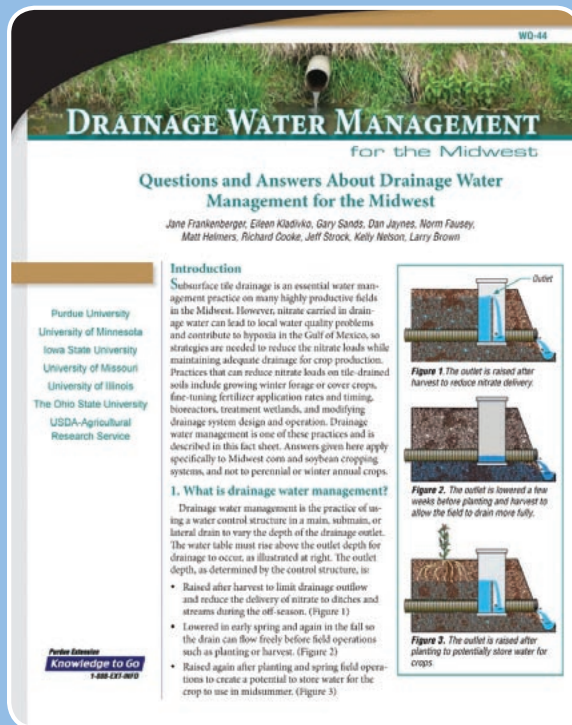
USDA Natural Resources Conservation Service

U.S. Environmental Protection Agency

The project continues to educate producers and contractors using the regional extension bulletin *Drainage Water Management in the Midwest*. Project staff also conducted an analysis to estimate the potential for drainage water management in Indiana based on soil drainage class, agricultural land use, and slope. These estimates will be used to help in promotion and analysis of the practice's potential.

## Outcomes

Partners in this project have distributed 8000 copies of *Drainage Water Management in the Midwest*, the regional Extension bulletin funded by this project, throughout the region and nationally. A second printing of 12,000 copies is underway to meet requests from throughout the region. The bulletin has been used in workshops and regional drainage schools, at field days, and by state and federal agency staff in each state. Drainage water management is not yet widely used, but the groundwork is being laid to establish the idea that drainage issues can no longer be ignored. The extensive demand for the publication demonstrates the broadening interest in drainage water management.



This publication is available at  
<http://www.ces.purdue.edu/extmedia/WQ/WQ-44.pdf>

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