

# Recycling and Reuse Technology Transfer Center

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### **Reduction of Non-point Source Contaminants in Agricultural Runoff and Leachate in Native and Non-Native Grass Plots**

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G. Krueger, Black Hawk County Health Department.

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AGRICULTURAL RUNOFF  
AND LEACHATE IN  
NATIVE AND NON-NATIVE  
GRASS PLOTS**

university of northern iowa

ENVIRONMENTAL  
PROGRAMS



*Environmental Science*  
*M.S. Thesis*

Gordon W. Krueger  
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University of Northern Iowa  
Cedar Falls, IA 50614-0421  
(319)273-2645  
(319)273-5815 FAX

## Abstract

Agricultural runoff is a primary source of non-source contamination of surface water. Nearly 26% of all potable water in Iowa is contaminated by nitrates. Levels of atrazine have been found to be as high as 17  $\mu\text{g}$  /L in the Mississippi River, while alachlor contamination ranges from 10 to 100  $\mu\text{g}$  /L in Iowa streams. The use of plants such as poplar trees and some species of grasses such as orchard grass to reduce contamination of water supplies has been the focus of numerous investigations and has met with at least some success. The focus of the present study is to investigate progressive reduction of agrichemicals in established native plots (Big Bluestem, Indian Grass, and Canada Wild Rye), non-native grass plots (Fescue and Brome) and corn plots with artificially supplied surface runoff and leachate versus time and distance. This was done following application of herbicides (atrazine, alachlor, and acetochlor) and ammonia-phosphorous fertilizer. Analysis of the herbicides, alachlor and atrazine was accomplished by Immunoassay. Atrazine was also analyzed by High Performance Liquid Chromatography (HPLC). Acetochlor concentration could not be determined by these methods. Surface and subsurface runoff was analyzed for trace amounts of nitrates, chloride, sulfate, ammonia, phosphate, and nitrites by Ion Chromatography (IC).