



Title: Control of Agricultural Loading Using Conservation Buffers

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Organization: University of Nebraska

State: NE **Region:** Heartland

Year of Funding: 2001

Theme: Nutrient and Pesticide Management

Situation: Water quality degradation in the Missouri River and tributaries has been attributed to pesticide, sediment and nutrient loading from agricultural land. While conservation buffers have been used for sediment and surface water pollution control, less is known about their ability to reduce contaminant levels in streams and groundwater. This project includes research in paired watersheds targeted because of elevated levels of agrichemical runoff.

Objectives: This site is a part of a comprehensive education and demonstration project to enhance landowner adoption of conservation buffers. The project's objective is to demonstrate the efficacy of grassed buffers on improving and protecting stream water quality by measuring loading in stream water in two adjacent watersheds - one with conservation buffers and one without - and to evaluate the effects of contaminant runoff and infiltration on shallow groundwater.

Methods: The Clear Creek research site includes modeling of a field-scale, streamside buffer to evaluate efficacy of sediment trapping; evaluation of grass buffer's influence on stream water quality using two adjacent watersheds, and evaluation of their influence on infiltration of contaminants. The Rogers Farm buffer site provides education to undergraduates related to grass buffers reducing soil loss. The Haskell Lab demonstration buffer provides nearly 1 mile of demonstration buffers of various designs to use in extension education.

Partnerships: The Central Platte Natural Resources District and the Nebraska Corn Growers Association originally requested UNL involvement in the research and have supported throughout. Two collaborating landowners (one a partnership) have been involved, and we hired our project engineer with the criteria to be the landowner liaison, which has worked well. A researcher with the US Forest Service Agroforestry Center has been a part of our research team, participating in our bi-weekly meetings.

Research: The integration has occurred around the theme of conservation buffer adoption and specifically, riparian grass buffers. Research is showing their efficacy, extension is getting them on the land, and teaching is training the next generation about buffers. Faculty involved in the research, are also involved in teaching and extension. We have collaborated with another USDA-CSREES-funded project to provide the integration of extension education, demonstration and outreach to landowners.

Resources: Financial partners have included the Central Platte Natural Resources District (annual support), the Nebraska Corn Growers Association (start-up support), and the Nebraska Department of Agriculture (start-up). Student support has been leveraged through the UNL Foundation Baker Endowment (two graduate assistants), the USDA National Needs Fellowship (one PhD), and the US Forest Service Agroforestry Center (operating and student stipends).

Results: Buffer adoption has occurred as a result of one-on-one outreach (11 contracts); a GIS data CD has been created: "GIS Site Descriptions: The Haskell, Rogers Farm, and Clear Creek Conservation Buffer Research, Education, and Extension Sites in Nebraska" Kellerman and Dosskey, 2002. Various research papers, one dissertation and results of sampling have been prepared and published. Three buffer field days have occurred for farmers and NRCS employees.



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