



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2002IA4B

Title: Predicting sorption, mobility, accumulation, and degradation potential of antibiotics in Iowa's soil/water environment

Project Type: Research

Focus Categories: Agriculture, Non Point Pollution, Toxic Substances

Keywords: Adsorption and sorption, leaching, organic compounds, manure lagoons, solute transport, biodegradation

Start Date: 03/01/2001

End Date: 02/28/2003

Federal Funds: \$14,000

Non-Federal Matching Funds: \$28,217

Congressional District: Iowa 3rd

Principal Investigator:

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Abstract

In this project we propose to evaluate three common farm-animal antibiotics, chlortetracycline (Aureomycin), oxytetracycline (Terramycin) and erythromycin (a macrolide) with respect to their fate in Iowa's soil/water environment. The expected results of this study will involve three aspects concerning fate of antibiotics. One aspect will involve elucidation of surface sorption of the selected antibiotics by organic and inorganic soil components. A second aspect will involve elucidation of the role of sorption on antibiotic mobility in soil, and a third aspect will involve half-life quantification of the selected antibiotics and cooperative or anti-cooperative contributions of the organic and inorganic surface-antibiotic interactions to the abiotic/biotic degradation process.

The results from this project will allow us to elucidate and predict the potential long-term consequences of antibiotics with respect to their potential distribution and persistence in Iowa's soil/water system. This type of information is of paramount importance in understanding the fate of antibiotics in the soil/water environment and proposing potential solutions to the problem.