Report as of FY2006 for 2006WI135B: "Measuring and Modeling Macroporous Soil Water and Solute Flux Below the Root Zone of a Plano Silt-Loam Soil"

Publications

Project 2006WI135B has resulted in no reported publications as of FY2006.

Report Follows

Annual Progress Report

Reporting Period: 7/1/2006 - 6/30/2007

Submitted By: Jim Hurley
Submitted: 6/20/2007

Project Title

WR05R002: Measuring and Modeling Macroporous Soil Water and Solute Flux Below the Root Zone of a Plano Silt-Loam Soil

Project Investigators

Brian Lepore, University of Wisconsin-Madison
Birl Lowery, University of Wisconsin-Madison
John Norman, University of Wisconsin-Madison

Progress Statement

An infiltration model based on the concept of Poiseuille equation has been developed for flow in a slit between soil structural units (peds), and Darcy's law was applied for flow from the slits into peds. The model allows for both saturated and unsaturated flow and is designed to be parameterized using relatively easily obtained field observations of soil structure. Initial parameterization was done using experimental field data acquired during the summers of 2005 and 2006 as part of the experimental aspects of this project. Water content and drainage data obtained from 1996 to 1999 at the same research site will be used for validation.
This model will be used as an infiltration module in the Precision Agriculture-Landscape Modeling System (PALMS) developed at the University of Wisconsin-Madison in support of the Wisconsin Buffer Initiative (WBI).
The experimental method developments and data and the infiltration model are expected to lead to three manuscripts for publication in peer reviewed journals. One manuscript has been submitted to the Soil Science Society of America Journal and one is in the final stage before submittal, while the third is still in its initial stages. All three manuscripts along with other material will compose the PhD thesis of Brian Lepore, who should complete his defense in summer, 2007.

Impacts

Description	The computer modeling simulation will improve the understanding of the types of landscapes and weather events which lead to increased rapid infiltration and drainage of rain water and dramatic groundwater contamination. The modeling studies will allow us to begin studying the impacts of different management decisions on risks of groundwater contamination.

Students & Post-Docs Supported

Student Name	Brian Lepore
Campus	University of Wisconsin-Madison

Advisor Name	Birl Lowery
Advisor Campus	University of Wisconsin-Madison

Degree	PhD
Graduation Month	
Graduation Year	2007
Department	Soil Science
Program	Soil Science
Thesis Title	
Thesis Abstract	

Student Name	Unknown Undergrad 1
Campus	University of Wisconsin-Madison

Advisor Name	
Advisor Campus	University of Wisconsin-Madison

Degree	Other
Graduation Month	
Graduation Year	
Department	
Program	
Thesis Title	
Thesis Abstract	

Student Name	Unknown Undergrad 2
Campus	University of Wisconsin-Madison

Advisor Name	
Advisor Campus	University of Wisconsin-Madison

Degree	Other
Graduation Month	
Graduation Year	
Department	
Program	
Thesis Title	
Thesis Abstract	