# Modeling coliform bacteria and bromide transport in large in-situ colums of a fractured soil. (S11sadeghi095058-Poster)

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# Abstract:

Manures are sources of several human pathogens which can potentially contribute to surface and ground water contamination. The objective of this study was to estimate rates of fecal coliform (FC) release from surface-applied bovine manure subject to simulated rainfall and subsequent leaching through 90-cm long lysimeters filled with undisturbed channery soil. Simulated rainfall of 7.1 cm/h was applied, and, when the flow stabilized, clumps of manure were placed on the soil surface and 1cm pulse of KBr solution was applied. Rainfall was continued for about 5 hours after application, and 10-min leachate portions were analyzed for turbidity, FC and bromide. The convective-dispersive equation with linear adsorption/exclusion and the first-order straining terms was used as a model of the coliform transport in soil. Asymptotic properties of the solution of this equation with the exponentially decreasing boundary concentration were used to infer the release rate constant from the FC breakthrough curves. The mobile-immobile zone model was applied to the bromide data. A value of 0.0054+/-0.0015 min-1 was found for the FC release rate constant. The regression line of reduced coliform concentrations on reduced turbidity values was not significantly different from the 'one-to-one' line; R2 was 0.807. Other detailed model findings/predictions with regard to FC leaching are discussed.

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