

ATRAZINE TRANSPORT THROUGH A GLACIAL TILL AQUIFER
IN NORTH-CENTRAL MISSOURI

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ABSTRACT

Although the claypan of North Central Missouri is traditionally believed to protect the groundwater from contamination, low concentrations of the herbicide atrazine have been detected in a shallow glacial till aquifer. The fate of the atrazine in the aquifer is not well known. With the continued use of atrazine, the concentration in the aquifer could increase to levels of concern or decrease if the conditions are not favorable for persistence. Beginning in the Fall 2007 and continuing through the Fall 2008, concentrations of atrazine and its degradation products deethylatrazine (DEA) and deisopropylatrazine (DIA) were measured at a typical field in Northeast Boone County, Missouri. The concentration ratio of DEA to atrazine (DAR) supports the concept that preferential flow paths within the claypan allow for direct transport of atrazine to the aquifer. These data were also necessary for constructing computer based flow models of the aquifer. Using the programs MODFLOW and MT3DMS within GMS 6.0, a groundwater flow model was produced that was coupled with a solute transport model of atrazine within the saturated zone. The model was constructed using constraints of historical use of atrazine since 1991. The model results were similar to those measured in the field and predictive simulations did not indicate an increase of atrazine concentration to alarming levels.