An Assessment of Drainage Systems in Richland County Corn Fields

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Purpose: To determine if there is a difference in the amounts of nitrate nitrogen and phosphorus in tiled and non-tiled corn fields in Richland County, North Dakota, and to determine if there is a link between the conductivity, nitrate, and phosphate levels of tile drainage water. Procedures: Collected soil samples from six tiled corn fields and water from tile drainage pumps and soil samples from six non-tiled corn fields once a week for twelve weeks. Soil Study: Used the LaMotte Soil Test kit to determine the levels of nitrate nitrogen, phosphorus, and pH in the soil collected in all twelve fields on weeks one, three, six, nine, and twelve. Water Study: 1) Used the Hach test kits to determine the levels of nitrate, phosphate, and pH in the tile drainage water collected every week. 2) Used the HM Digital Conductivity Meter to determine the conductivity levels of the drainage water. Stalk Nitrate Nitrogen Test: 1) Cut corn stalk six inches and fourteen inches from soil. 2) Quartered the eight inch stalk. 3) Mailed to Cornell University for test to be conducted. Conclusion: The levels of nitrate nitrogen and phosphorus in tiled and non-tiled fields were very close. I feel that nitrate and conductivity levels rise and fall together, but not consistently enough to be used to predict levels. After analyzing all aspects of my research, I believe tiling a field will not harm the crops or environment, but it will also not significantly increase yields on a dry year.

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