RESEARCH ABSTRACT

ENVIRONMENT

TITLE: Evaluating Nutrient (nitrogen and ortho-phosphate) Export with Subsurface Drainage Water from Spring Applied Swine Manure to Soybean Planted Micro-watersheds - **NPB #12-117**

INVESTIGATORS: Kapil Arora, Carl Pederson, Dr. Matt Helmers, and Dr. Ramesh Kanwar

INSTITUTION: Iowa State University

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SCIENTIFIC ABSTRACT

Manure application to soybeans has been put under focus in the recent years. Currently, in Iowa, there is a limit of 100 pounds per acre of available nitrogen that can be applied for soybean crop use. A One-year study was conducted to compare nutrient movement with sub-surface tile water between a manure applied micro-watershed and a no manure applied micro-watershed, with both planted to soybeans. Two additional micro-watersheds, planted to corn with no manure and fall – applied nitrogen, were monitored in 2012. These two micro-watersheds were planted to soybeans and monitored in 2011. Nutrients observed in this study were nitrate-N (NO_3-N) and ortho-phosphate (PO_4-P). Micro-watershed with manure applied yielded more flow volume than the micro-watershed with no manure application, with both planted to soybeans. Consequently, nitrate-N mass was higher for the micro-watershed with manure applied in comparison with the micro-watershed with no manure application. The sub-surface drainage area contributing flow to drainage tile line can be different than the surface area of the watershed due to changes in the hydraulic conductivity of the soils below the ground surface. As such, flow weighted nutrient concentrations present a better comparison statistic. Flow weighted nitrate-N concentration was higher for the micro-watershed post manure application in comparison to the pre-manure application time period. Flow weighted ortho- phosphate concentration was higher for the micro-watershed with manure applied than the micro-watersheds with no manure applied. A very limited number of water samples showed ortho-phosphate concentrations above the non-detect limit. The use of data presented in this report should be evaluated carefully as it is a non-replicated study with data observed and reported during a drought year.